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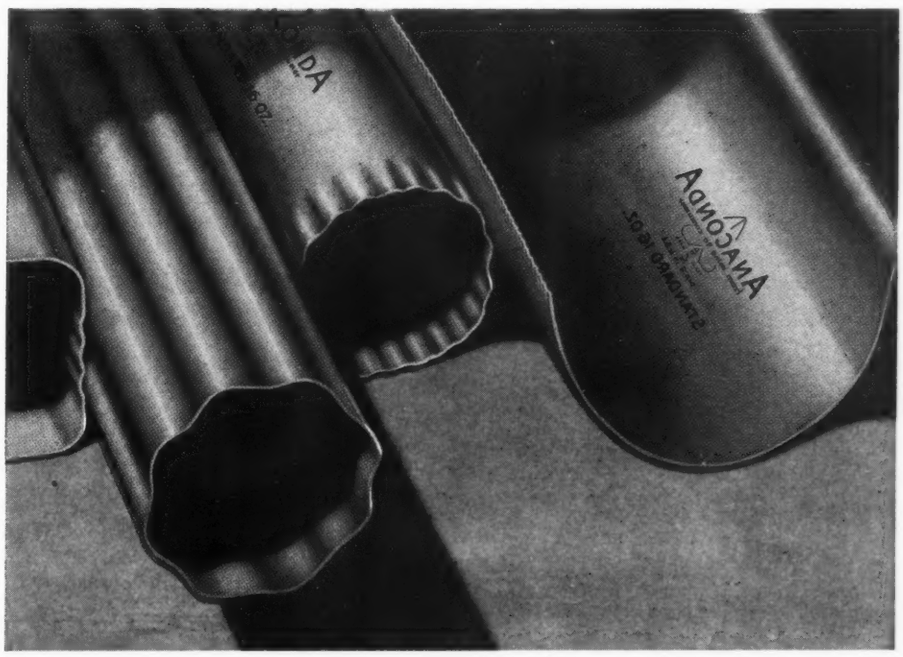

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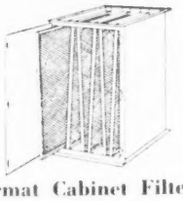

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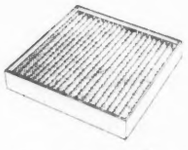

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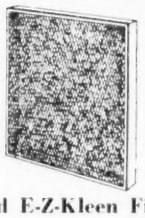

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FEBRUARY 1, 1932

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J. D. Wilder
Editor

Platte Overton
Engineering Editor

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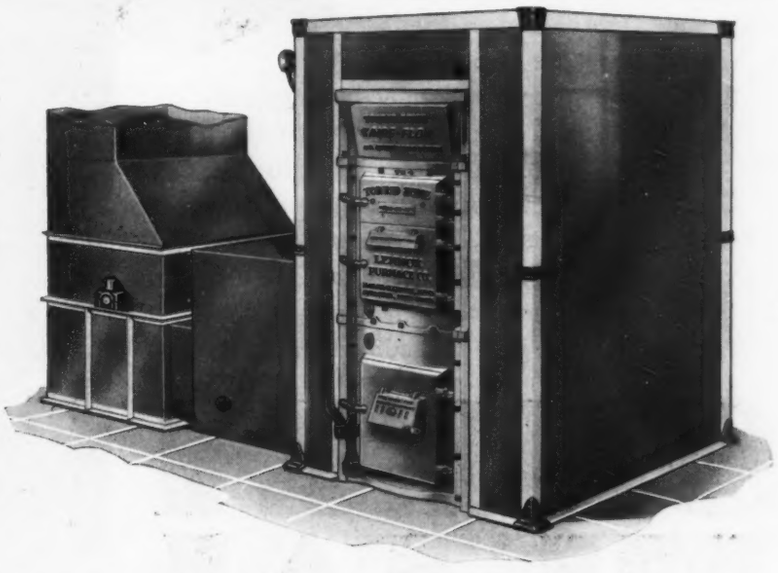

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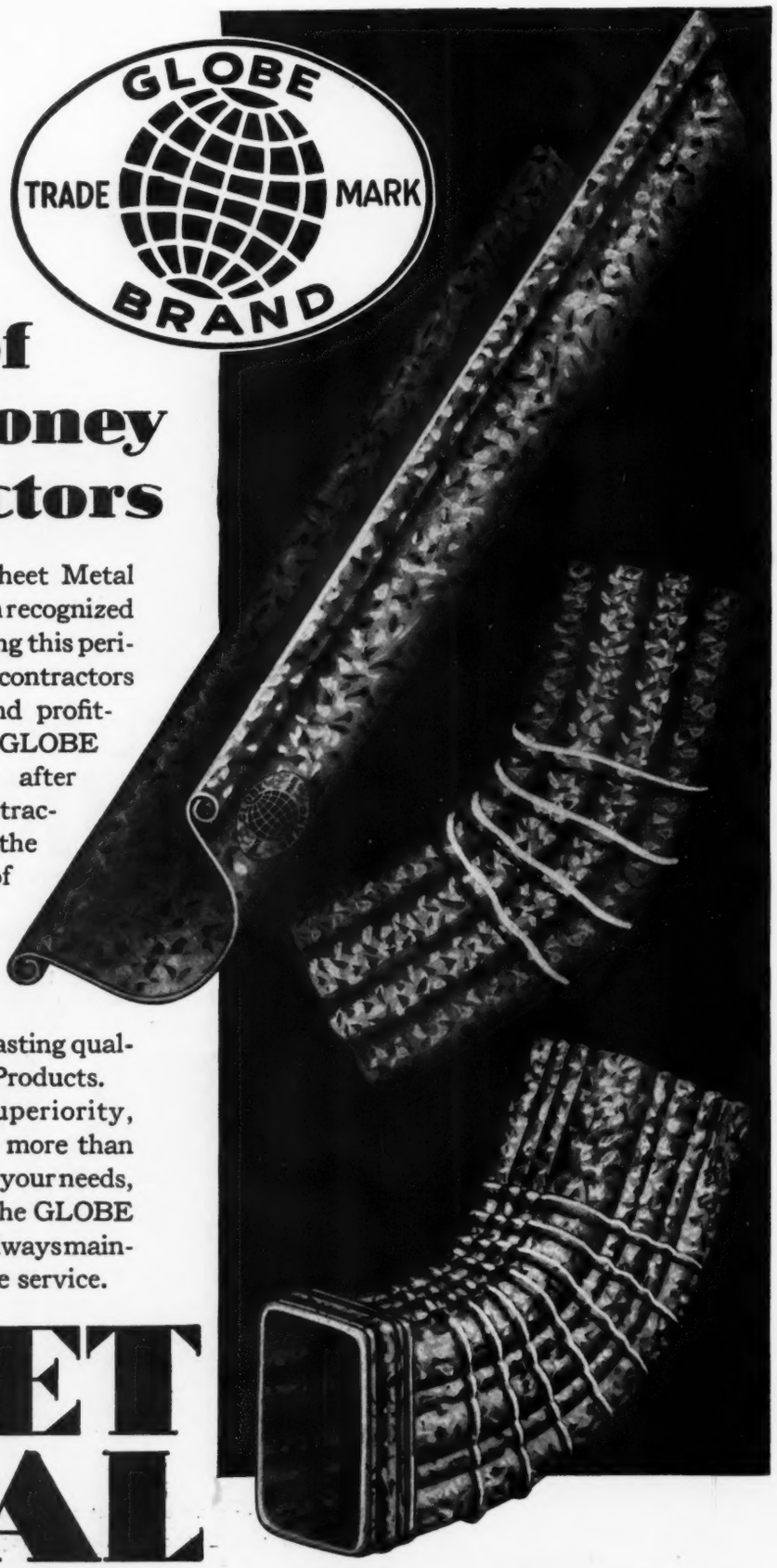

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SHEET METAL

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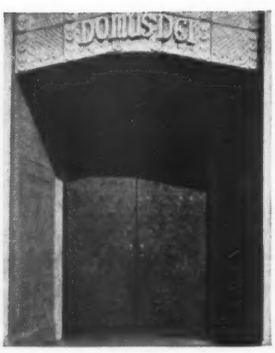

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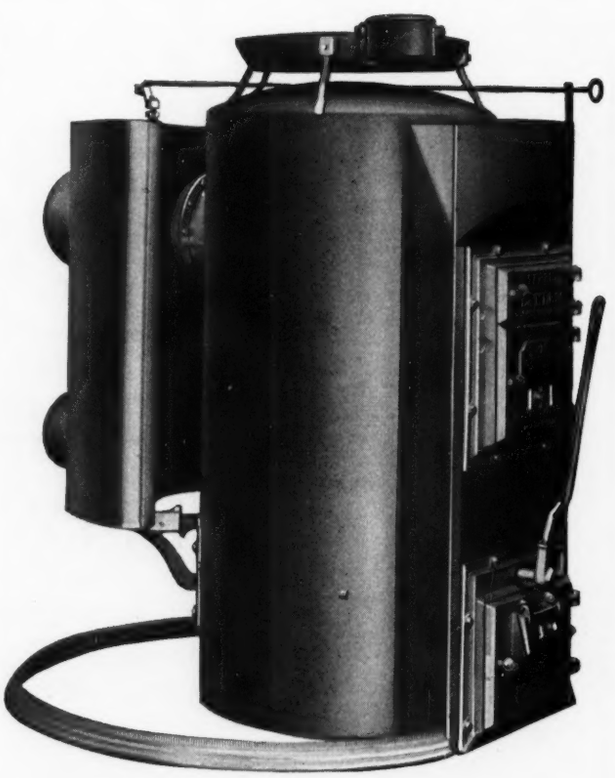

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AMERICAN ARTISAN

VOLUME 101 NUMBER 3

WARM AIR HEATING • SHEET METAL CONTRACTING • AIR CONDITIONING

We Are Making Progress

TO our way of thinking, two significant expressions of opinion have been rendered this year in the conventions held to date.

The first is the resolution passed and adopted into the Indiana state association by-laws clearly defining the scope of work over which the sheet metal and warm air heating industries claim jurisdiction.

The second is the discussion held in Louisville regarding the feasibility and desirability of having all sheet metal, ventilation and warm air heating contractors licensed under some plan which will keep the fly-by-nights, cut-throat operators, irresponsible contractors out of the business.

Regarding the first, there can be little doubt that just such a resolution has been needed for a long time. For example, in probably every community metal work which should rightly go to our contractors has been claimed and installed by other trades who have had more initiative, but certainly less right to the work, than our trade.

Such a definition of sheet metal jurisdiction has long been needed. The situation has become especially acute within the last two years, or since the introduction of new metals opened up entirely new fields for the use of sheets. Our industry has sat by while store fronts, kitchen equipment, ventilation work, exterior fabrication for buildings and a long list of metal work has gone to other trades, simply because the buyer and the specifier did not realize, and cared less, who got the job.

Many contractors have felt, perhaps, that because sheet metal contracting is one of the oldest of crafts, everyone knows who the sheet metal contractor is and what he is supposed to do. As a matter of plain fact, most people have and still think of a sheet metal contractor as the local tinsmith. To be equally frank, we have in most communities and outside of a few aggressive contractors, let this definition go unanswered simply because we have been too lazy to do anything about it.

Now we have in the by-laws of at least one important organization a clear definition of what our industry is and does. It is to be hoped that every association—national, state, and local will follow this move and adopt the same program in their regulations.

We published at least twice last year editorials dealing with this matter of licensing contractors so that the general level of business ability, financial responsibility and workmanship might be raised. We received more criticism than commendation for this expression. But it seems as though other men have looked over the situation carefully and come to the same conclusion we did—that the present situation is intolerable and likely to lead to still further trouble and that something, even though it be so radical a move as a licensing program, must be undertaken.

Contractors have asked us, "Even though we are licensed, what is to keep the irresponsible operator who has money out of business?" And our answer has been—because any licensing program to have teeth in it must have complete control over who shall and shall not operate and also have the right and power to revoke the license of any contractor who fails to live up to the regulations.

We have also been asked, "Who is going to determine what the regulations shall be and who will constitute the board of control?" And our answer has been that necessary regulations can be very simple. Any contractor can be licensed providing he knows the business he is in or has an organization which does; second, that he can show financial responsibility so that financial redress can be had; and third, he must operate ethically. Beyond these three regulations, little else is needed.

As to who shall be the governing board, we suggested a board of from five to nine members, one member appointed by the local or state political leadership and the rest elected by the local association or trade associations inside a state.

There must be, also, co-operation from manufacturers and jobbers. It should be impossible for an unlicensed contractor to buy goods.

While even these few regulations may seem impossible of attainment, the first move has been made. From now on progress will be determined by just how much our contractors really want to protect themselves.

Sheet Metal, Intricately Fabricated, Protects Large Suburban Home

By **THOMAS R. SHAVER**

THE country home of Mr. Max Epstein, now nearing completion in one of the suburbs north of Chicago, well illustrates the importance of sheet metal in residence structures of considerable cost. It is perhaps an even better illustration of the possibilities of the material, in solving unusual problems of the architect and engineer.

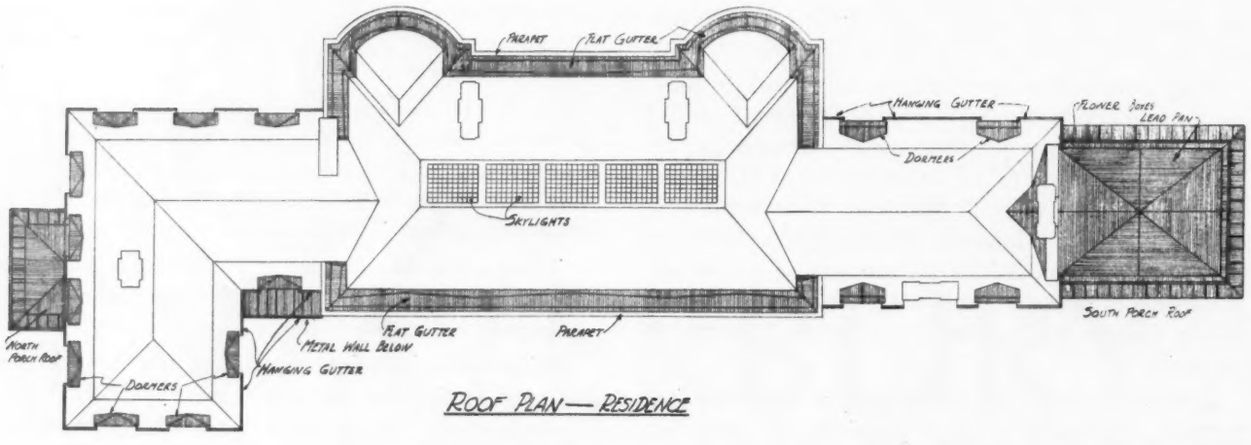
This establishment consists of the residence, two gate buildings, and a small building for gardeners' equipment and storage. The gate buildings are the garage, greenhouse, and living quarters for employees. In all there are five buildings, covering a ground area of about 12,500 square feet. The buildings were designed by Samuel A. Marx, architect, and the sheet metal work described was done by C. E. Jensen and Sons, of Chicago.

The residence was designed to be as free from the need for maintenance as architectural and engineering skill and experience and the most permanent of materials and excellent workmanship could make it. The building is entirely fireproof, all floors and the roof being reinforced concrete with no wood supporting members or exposed steel. The walls are masonry of brick and tile with stone trim. The roof is made of clay tile with concrete ribs between. On this construction and in all gutters is two inches (or more for fills) of a special nailing concrete into which all sheet metal and the shingle tile roof covering are fastened with copper nails. The length of life of this structure cannot be computed, because there is no data available which has been kept long enough to note the final decay of the materials used. The sheet metal work was designed for the same enduring qualities as the structure of which it is a part.

The roof plan shows the metal used for water protection with the exception of the ordinary flashing, or that flashing which is used against chimneys and other vertical surfaces, under the tile at the valleys, and at the edges of the sky lights. All of the metal shown, and the flashings and counter flashings with the exceptions described later, are of copper coated on both sides with lead. Decks and wide gutters are laid over No. 30 asphalt felt.

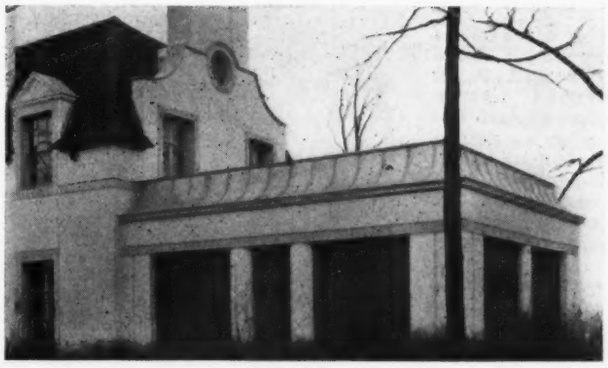
The wide gutters around the central portion of the house are made to protect the parapet wall and the stone coping, and to extend well up under the tile at the opposite side. A typical section of this gutter is shown. The gutter drains through strainers into conductor pipes running down through hollow spaces provided in all exterior walls for heating ducts.

Hanging gutters around the two wings where there is no parapet are all 6 inches wide. Drains consist of No. 10 copper wire basket strainers, elbows of 3-inch pipe running into the walls, and pipe downspouts in the walls. Gutter spreaders and stiffeners are of 3/16 inch by 1 inch bronze straps spaced about 36 inches on centers. The rolled edge is reinforced with ½-inch round bronze rods, and the opposite edge is run up 8 inches under the roof tiles.

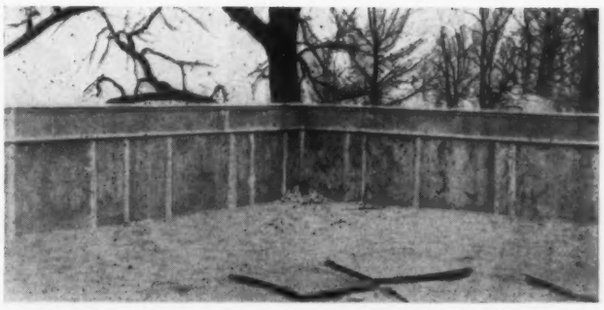


ROOF PLAN — RESIDENCE

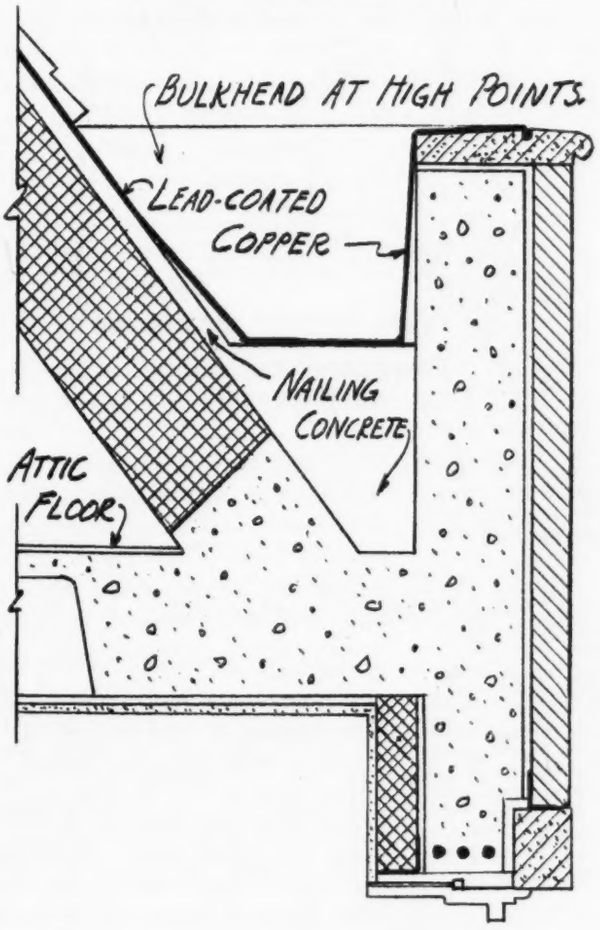
The shaded areas in this roof plan indicate points at which sheet metal was used for protection and ornamentation



Above is an exterior view of the south porch which will be a second floor garden. The outside face is sheathed in copper as shown here



Above is a view of the same porch from the inside. The top of the wall carries a continuous lead coated copper flower box. The vertical sides and the floor are covered in sheet lead. Dirt for grass and flowers will be laid on the sheet



DETAIL OF FLAT GUTTER

At the left is the method of forming flat gutters. The copper sheet is continuous from the stone parapet to a point well under the tile roof. Bulkheads are placed frequently along the gutter. Drainage is through pipe passed down spaces in the walls

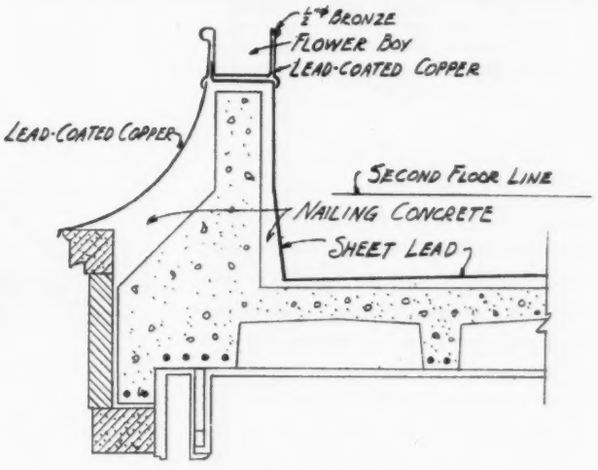
The roofs of all dormers are of metal, all made up with flat seams.

The sheet metal work so far described is duplicated on the gate buildings except that outside downspouts are the rule. All roof drains are hanging gutters except those for the garage, which has a parapet wall, and gutters behind this parapet are similar in detail to that used for the residence. Scuppers carry the water to the downspouts from these gutters.

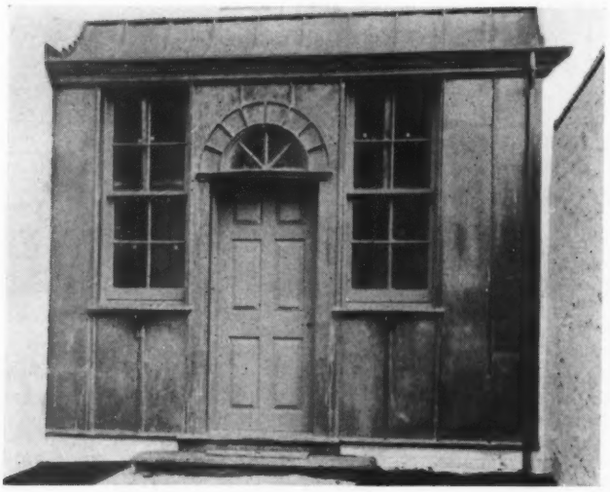
The front of the flower room and a portion of the roof at that point are made of metal. The wall is all metal except the wood door and window above, and the two side windows. The gutter at the edge of this roof, and also the gutters at the north porch, are formed to be a part of the cornice moulding. The metal return at the sides of window and door openings and at the heads of the windows. The transom bar is covered with metal, as are the window sills and brackets under them. Joints for wall and the exposed part of this and the two porch roofs have a rounded cap strip over each vertical seam. Metal for walls is returned back of the brick at the two sides, and the roof metal is run behind the brick at both sides and top. The shaped work was all hand hammered at the Jensen shop.

There are two metal hoods, one at the entrance to each of the two gate buildings, which show craftsmanship of the highest order. Sheets which form the segments of these hoods were stretched to curve in two directions, and the seam caps,

This cross-section shows the copper flower boxes and the lead sheet of the second floor garden



DETAIL OF SOUTH PORCH



This is the side of the flower room. The wall is all capped batten seam copper. The gutter is a part of the copper molding. Even the door transom bar and the window sills are copper. All the shaped work was hand hammered by Jensen

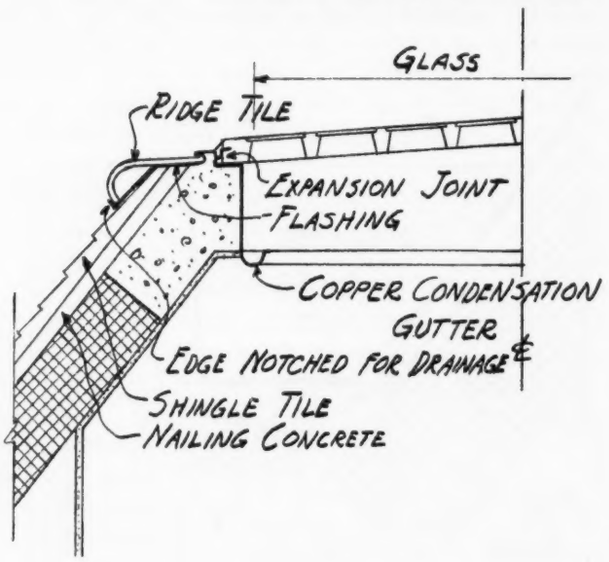
similar in shape to those used for other vertical joints, were graduated in width and depth from ⅜ inch at the top to ¾ inch at the bottom. The metal is fastened to a steel supporting frame by countersunk brass bolts with the heads covered with solder.

Above is a typical round hanging gutter and the copper covered north porch roof. Notice that all drainage is through inner wall pipes

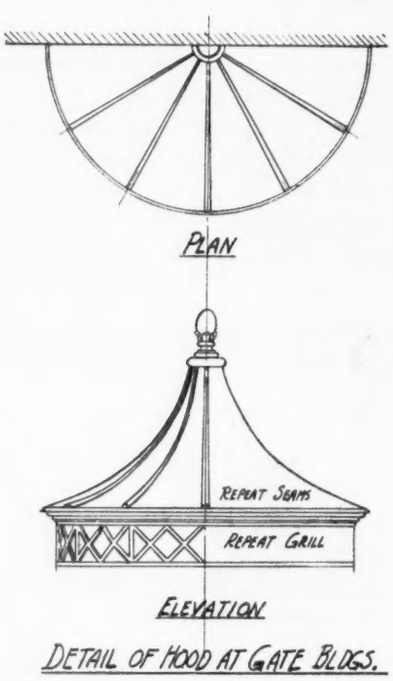
The south porch roof, which is really a second floor garden, is a feature that could hardly have been possible without sheet metal. The entire area is covered with a pan of No. 4 sheet lead, which is brought up to form a facing for the inside walls. Lead-coated copper is used to form a continuous row of flower boxes along the top of the wall on three sides, and a sloping return face on the outside. The pan has a drain with strainer in each of the four corners, and ¾ inch drains at about 5 feet on centers are provided in the flower boxes. When completed, enough earth will be put on the pan to allow of the growing of boxes grass and plants. Flag stone paths will be laid, the flower boxes will be filled with plants, and there is a garden just beyond the doors of one of the master bedrooms.

Other sheet metal uses are in concealed flashings protecting all projecting brick courses on both the residence and the gate buildings. The flashing around the skylight, shown in detail, is made of uncoated copper since a narrow strip is exposed below the ridge tile, and the color of copper after weathering will match closely that of the roof tiles. Transom bars at outside doors are covered with lead-coated copper, and the tops of shutters are protected with strips of this material cut slightly wider than the thickness of the shutter. Chimney tops are protected from damage by moisture and freezing by a sheet of metal under each stone cap, made 3 inches larger all around than the chimney, with flue holes cut through and the outer edges turned down to form a drip. There is a copper condensation gutter under the skylight, in the attic. The roof of the gazebo, shown in a photograph, is metal.

The emphasis placed on absolute protection is illustrated by this detail of the metal work at the deck mold adjacent to a roof skylight section. The interesting feature is the two-piece copper sheet which extends from the lower edge of the ridge tile to the inside turn of the interior condensation gutter

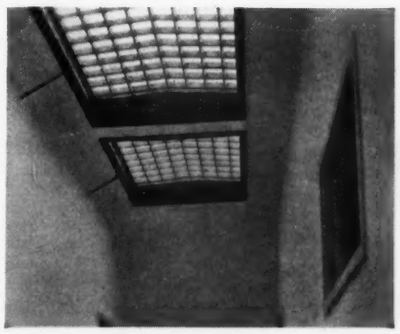


DETAIL AT SKYLIGHT



DETAIL OF HOOD AT GATE BLDGS.

This shows the construction on the ornamental towers of the twin gate houses. The text explains the intricacy of the pattern used



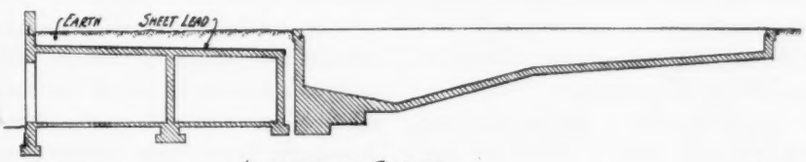
This shows the appearance of the skylights. All metal sections were fabricated in the Jensen shop

In general, all metal seams are locked and soldered. Sheets are fastened by cleats nailed directly into the nailing concrete with copper nails. Expansion and contraction in two directions is provided for.

Another feature which, like the south porch garden, could hardly have been possible without sheet metal, is the underground structure for the dressing rooms and machine room of the swimming pool. This structure is built under the surface of the ground at the north end of the pool, in which position it does not interrupt the view across the garden to the lake, but it also takes advantage of a ravine that runs along the north line of the property, and on which the building faces.

The building is entered by means of a curving stone stair from the main garden level. The location adopted for the pool building allowed the planting to be carried all around the pool, but again there was need of a water tight and enduring covering over the concrete slab that carries the load of earth, plants, and users of the spring board at the north end of the pool. Sheet lead of No. 4 weight was used. The lead is carried up the sides of the parapet wall to the top of concrete, at about grade level, then returned back of the stone facing and up another 6 inches. No vents from the plumbing fixtures in the dressing rooms are carried through this deck, as pipe ends in this area would be as objectionable as at any other part of the garden, and consequently there are no holes of any sort in the sheet. The size of the pool building which is covered is shown on one of the drawings.

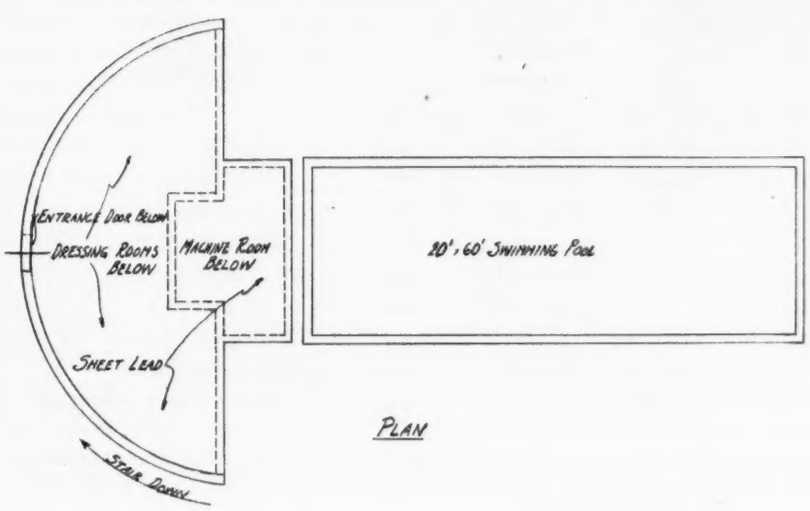
All sheet metal work was designed for a long life and fine appearance. The workmanship requirements were very exacting, and an enormous amount of hand work was necessary. Some of the finest of the hand work was done by Mr. C. E. Jensen, now in his seventy-seventh year, who has been doing work of that sort all his life. The structures on the estate show some of the best details and the best materials for protective work on residences, striking architectural effects by the use of metal, and features that would have been impossible without the metal.



LONGITUDINAL SECTION

The cross-section above shows how the underground dressing room for the pool is protected against water penetration by the extensive use of sheet lead

The dressing room, at the end of the pool, cannot be noticed from the pool. Stairs lead down through the copper roofed stair house at the right. The metal protection will make it possible to landscape the pool edges



PLAN

The plan of the swimming pool shows where the machine and dressing rooms are located underground. These rooms are protected by heavy sheet lead

Where and How Should I Set My Blower Control [Part I]

WHEN gravity warm air heating systems were the only type of installation sold, automatic controls were not considered an essential part of the system. But with the introduction of forced air, some form of control for the fan became necessary. The first controls were, of course, manual ones. The owner pressed a button and the fan started. If the owner was attentive he stopped the fan when the house warmed up or when he shut the drafts.

Naturally, this form of operation was not satisfactory; owners forgot to turn the fan on and even more frequently forgot to turn it off. The result was that the forced air system operated on a hit-or-miss basis.

The introduction of automatic controls completely eliminated this hit-or-miss condition. A thermometer placed in the furnace bonnet turned the fan on when a specified temperature had been reached and turned the fan off when the temperature dropped below this point. From a control standpoint, perfection had then been reached.

But inquisitive installers early learned that there had to be other considerations made in using these controls. Some found that placing the control in a certain position on the furnace they handled put the thermometer in a "cold" spot and that the fan actually threw hotter air into the rooms and shut off too late, so that the system over-rode the house thermometer.

Other installers discovered that radiant heat affected the device and that while the system was supposed to furnish air at 120 degrees, it actually was furnishing air at 95 degrees, because radiant heat pushed up the temperature of the thermometer without affecting the air within the casing.

These problems of setting the fan control have been ironed out in most instances by the individual. That there is no uniformity of setting is amply proved by the tabulation, which lists present practice from a number of installers. Doubtless there are dozens of other settings in use. (See Fig. 1.)

Regardless of how many different settings there may be in use, there must be and are some basic principles to apply in selecting any pair of settings for your jobs. This article will attempt to outline and discuss these fundamental principles.

First: Just where to place the bonnet thermometer. Briefly, this is determined by the type of furnace you are using. It can be placed anywhere around the bonnet, excepting in a "cold spot" if one or more of these exist in your heater casing. It can be placed in a trunk, providing there are plenty of registers from this trunk so that the whole trunk can't be shut off simultaneously.

Second: Shielding seems to be both avoided and made use of, but there are no authentic data available as yet on the effect of radiant heat.

Third: At what temperature should the fan turn on? There

Contractor	Blower Starts At	Blower Shuts Off At	Control Is Located In	Is The Control Shielded	What Part of Bonnet Do You Consider Best For Control
Jos. Meyer & Son, - Buffalo, N.Y.	135°	115°	Bonnet [1]	No	Varies
W.A. Haberstroh & Son - Omaha	110°	100°	Bonnet	Yes [2]	Center, Side
W.A. Rummel - South Bend, Ind.	175°-250°	125°-200°	Bonnet	No	Front
Trask Heating Co. - Boston	145°-150°	90°-100°	Bonnet	Yes	Side
Kruse Co. - Indianapolis, Ind.	Varies [3]	Same	Bonnet	No	Varies
Schwartz Furnace Co. - Pittsburgh	120°	110°	Bonnet	No	Varies [4]
Ba-Del Co. - St. Louis	250°	200°	Bonnet-Trunk	No	All sides
Freed Furnace Co. - Moline, Ill.	150°	120°	Bonnet	No	Front
G.A. Voorhees - Indianapolis	Varies	—	Bonnet [5]	No	Front
Hunt Bros. - Kansas City, Mo.	120°-150°	110°-130°	Bonnet	No	Front
B.F. John - Philadelphia	175°-200°	140°-165°	Bonnet	Yes	Sides or Back
Olson Bros. - Omaha	140°-175° [6]	120°-145° [7]	Bonnet	Yes	Over Blower Nozzel

Here is a chart on which is plotted typical blower settings by representative heating contractors. Notice what a wide variation there is in the temperatures used. They may all be right, but we don't think they are. The text explains why this chart was made

seems to be a wide range in use, ranging from less than 100 degrees to as high as 250 degrees.

Fourth: At what temperature does the blower shut off? Again there are many settings, all of which can't be right.

The question "At what bonnet temperature should the blower start to operate?" is most recurring.

Theoretically, the desired inlet temperature at the warm air grille should govern. Authorities have agreed that 120 degrees is a maximum for good heating and air conditioning practice in homes. However, in large, exposed rooms with a high heat loss sufficient air at 120 degrees to offset the B.t.u. loss may create too high an air change. The higher the inlet temperature the quicker the room will heat and the less the fan will operate. While the ideal condition is based on a continuous operation of the blower, we know that the majority of systems function intermittently. If continuous operation is ideal, it would follow that on intermittent systems the more the fan operated, the better; hence, the lower the inlet temperature, the better the conditions in the rooms served.

The foregoing is theory. Now in practice we may find many answers to the above questions. To quote Mr. Gilbert E. Olson of Omaha, Nebraska: "Should the blower be hooked in series with a warm air furnace having an oil burner generating the heat, it is oftentimes advisable to use a lower bonnet temterature setting than for other fuels. . . . The oil burner when coming on will generate such a terrific heat that unless the fan is started soon, the fan may not carry away the heat and overheating in the casings results."

To further quote Mr. Olsen: "With gas-fired units, the heating-up time is longer, and the bonnet temperature may be set higher to give the casting time to heat up."

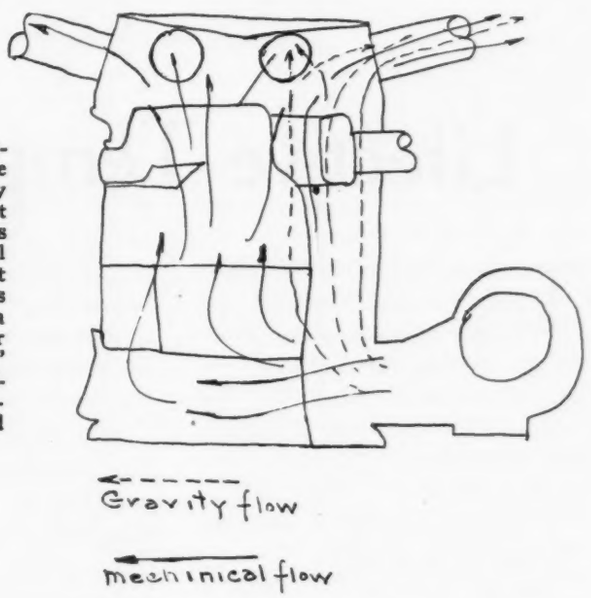
The analysis of the settings listed in the table may be summed up in the statement by Guy Voorhees: "I don't know of any specified bonnet temperature at which such a switch can be set to turn the blower on and off. It not only varies with different furnaces, but it varies rather largely with a given make and size of furnace."

The design of the system no doubt will affect the temperature at which the "stat" in the bonnet should be set. In semi-gravity plants where the air passes through the fan or through by-passes, the temperature does not build up rapidly, due to the continual passing of the air. Here the bonnet "stat" may be a near indication of the air temperature passing into the supply duct, but on a straight mechanical system with small ducts and high velocities, and with air confined in the plenum until the blower starts, the gauge on the furnace stat may be no indication of the temperature of the air a few seconds after the fan starts.

On installations with an inserted indicating thermometer it has been observed that temperatures as high as 250 degrees were recorded, but this temperature dropped to 150 degrees 30 seconds after the fan had started. In such cases it is safe to say that bonnet temperature before the fan is started is no indication of what inlet temperatures may be.

The practical answer to the question of where or at what temperatures to set the furnace stat, depends on the test. This control should be set on a cold day after a test over a period of hours and the instrument sealed against tampering by the owner or any pseudo engineer. The contractor should return on the average mild day and make another test. Somewhere between the coldest winter weather and the average mild day will be found the correct adjustment.

The majority of answers to the question: "Where should the control be located?" place the stat in the casing bonnet. Mr. Voorhees states: "Usually where the air leaves through a single trunk line, the whole job is a specially designed system for which 'standard' rules are hard to make."

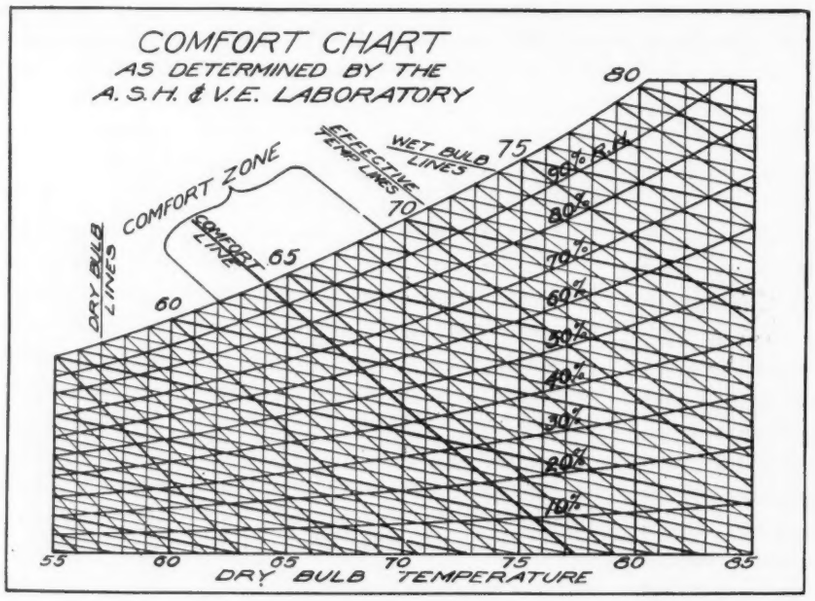


When a system operates on gravity, the flow of air is in easy sweeps upward, but when the fan goes on a large internal pressure throughout the entire casing is set up. There is a wide difference in air flow and "cold spots" under the two conditions. You must locate your control with this in mind

Mr. B. L. Schwartz of Pittsburgh, who has installed some excellent semi-air conditioning systems, says, "Our fan control is usually located in the bonnet of the furnace or in the trunk manifold immediately above it." Note that he says *usually*.

The investigation proves Mr. Voorhees' statement. Freak conditions may vary the locations.

In poorly designed trunk line systems (too large) the system has been improved by installing a thermostat in the *far end* of the trunk. A majority of the rooms heated by gravity, but those on the far end of the trunk cooled too much before the near rooms called for heat.



There are literally dozens of Comfort Charts. Some are simple, others require real mathematical ability to use. This is a simple one, widely recognized and suitable for the air conditioning engineer, except in unusual conditions

Effective Temperatures—Clouds

THE reaction to the first article on "Air Conditioning," was almost instantaneous. Some of the questions referred to a typographical error in the article: "Wet bulb temperature reads 65 degrees. Dry bulb shows 72 degrees. The relative humidity is 40 per cent."

(This should read 70 per cent. We beg your pardon.)

Another question is: "What is meant by effective temperature lines?" This refers to the comfort chart on page 16 of the January 18 issue of the AMERICAN ARTISAN.

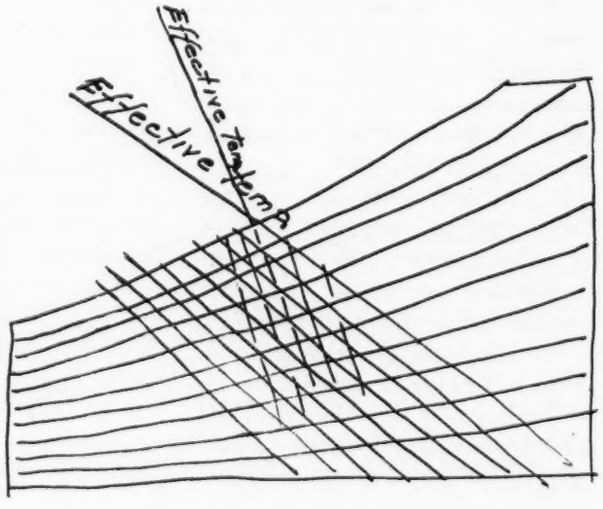
Effective temperature refers to the effect on the occupants of the areas under consideration. Temperature, humidity, air motion, clothing on the occupants, their activity, and many other items will effect the effective temperature lines. Fig. 4 gives the idea of how these lines may vary. The figure is not correct for angle but is merely used as an example.

We all know that a room may be comfortable at one temperature yet very uncomfortable at another time at the same temperature. This may be due to relative humidity, air motion or both. The expression "effective temperature" means or designates any conditions maintaining the same degree of comfort upon the human body.

When we say "effective temperature" we may mean 70 degrees temperature (dry bulb) and 45 per cent relative humidity or 68 degree (dry bulb) and 60 per cent relative humidity. Either condition will have the same effect as regards comfort. Even these two effective temperatures may vary with air motion and this will be discussed in a future article.

The chart as given has effective temperature lines for persons normally clothed and normally active, such as we would experience in the average home.

It is obvious that if one were to attempt to play football or split wood in the same atmosphere as the living room normally air conditioned we would be uncomfortable. We would require more air motion, less temperature and less relative



This rough sketch shows how the same comfort line on the chart above may vary, keeping all the while the same comfort possibilities for the room occupant. Bear in mind that temperature and humidity vary in relationship as either one is changed

humidity. All these items are important, for it must be remembered that we will "air condition" gymnasiums before we are through with these articles.

One gentleman writes in: "You state that moist air is heavier than dry air at the same temperature and pressure. If that were true, clouds should be found on the ground rather than in the sky, and barometers should reverse their action.

If the gentleman lived in London, England, he would find the "clouds" on the ground about half the time. Has he ever been in a fog?

FIG 10

Drafts are one physical phenomena most heating men know little about. Doctors say a draft on the neck is most likely to lead to colds. A draft may be defined as any strata of air colder than the surrounding air. The text explains how a draft works

"At the same temperature and *pressure.*" When the pressure varies the clouds do come down, or go up.

A barometer is not truly a weather indicator. It merely indicates atmospheric pressure and any change in atmospheric pressure "may" indicate a change in the weather. Incidentally it may not.

Clouds are accumulations of vapor. Air is continually absorbing moisture. As this air "rises" (indicated by a falling barometer) it comes under less and less pressure to the extent of the air below. As this rising air expands because the pressure is lower, it expands against the weight of air still above it. Expansion against pressure means "work." When gas "works" (air is a gas) it gives up its heat. Hence it gets colder and colder. As the dew point is passed, this moisture forms into vapor visible to the human eye. This is a cloud in the air or fog on the ground. The particles of moisture are still small. As these clouds become dense the particles grow until inertia is overcome and they fall and we have rain or snow. This also explains why it is colder on a mountain top than it is at low altitudes.

As stated, effective temperatures depend on humidity, temperature and air motion. A constant circulation of air is necessary to good air conditioning. Authorities do not always agree on just what velocity of air is best for human health and comfort, but for these articles we will base such velocities on the average findings. That the effective temperature will vary with humidity and air motion has been established.

For humans normally clothed and slightly active in a velocity of say 50 or 60 feet per minute with the dry bulb at 70 degrees and the relative humidity at 20 per cent, the effective temperature would be 63 degrees approximately. One could not say that this is comfortable.

It would be necessary to raise the dry bulb temperature to 78 degrees with 20 per cent relative humidity and a velocity of 50 or 60 feet per minute air movement to make the effective temperature 69 degrees. This would fall in the comfort zone, but is not the most ideal condition.

Circulation of air without "drafts." What is a draft?

The human body is continually radiating heat. It is more clear to say that the body is passing off heat. We may describe the ideal condition as being such time as the body radiates or passes off heat in every direction in the same amounts or in the amounts most suited to health and comfort.

If we place a piece of ice on the back of the hand we radiate heat faster from the back of that hand than we would the other and we have an unbalanced condition. Various parts of our body will be found to be more sensitive than others.

If we were to place this piece of ice on the back of our neck we would immediately realize that the discomfort is greater than it was on the back of our hand. It will be found that this is true in many cases with the feet of a person. Some authorities have declared that the back of the neck if subject to a draft is more liable to cause colds than any other part of the body.

We might then say that a draft is a movement of air either too cold or too moist, or at too high a velocity or a combination of all three that will blow against some part of the body and remove the heat at a greater or faster rate than the balance of the body. It would be reasonable to say that this removed heat or the rate of removing it from this section of the body would cause a cold only if the loss of heat were far in excess of a normal loss.

We all know we continually "expose" ourselves to such colds and nine times out of ten nothing happens. Here is where the physico-local enters. Much depends on the person, but in the design of air conditioning systems the designer should strive to eliminate any drafts, for if they do not cause colds they will cause discomfort.

In air circulation for the well designed air conditioning system, elimination of drafts depends on air temperatures at the supply and exhaust grilles, location of such grilles and the number of them for any given area. Velocities and their control are also important. It is important that we circulate the air. It is also important that we circulate this air *all over* the area conditioned.

Louisville Convention

ONE of the most unusual conventions yet staged by the National Association of Sheet Metal Contractors was held last week in Louisville, when sheet metal contractors met with contractors of roofing and slate work. The convention was a joint meeting of our association and the United Roofing Contractors Association and the Roofers Division of the National Slate Association.

The program was divided so that each of the organizations held a fair share of the time and a representative list of speakers. Visitors and members attending declared the experiment a success, both from the standpoint of interest shown in the sessions and at the displays, and also because the idea of holding all three association meetings simultaneously enabled a larger number of men and companies to attend.

Business

Perhaps the most important piece of business transacted was the change in the national association's by-laws to benefit the financial standing of the organization. In addition to the main change recommended and accepted, a number of minor changes in wording of various by-law sections were made to make this new change workable. The new section is as follows:

"That local associations and individual members pay their per capita tax or dues to the National Association instead of State Associations as in the past; and that State Associations, as such, be exempt from payment of dues to the National Association."

In the change recommended in the method of collecting dues it is intended that State Associations continue to function as in the past, excepting that they may make an adjustment in their dues so as not to include per capita tax or dues for the National Association.

That local associations and individual members pay their dues or per capita tax direct to the National Association.

It does not mean that State Associations should be dropped from membership in the National Association, nor does it contemplate the weakening of the position of the State Associations.

It should result in strengthening both the State Associations and the National.

State Associations can best look after the interests of their members, and the industry as a whole, on state legislation which may be harmful to the industry. The National Association office can act as a clearing house between State Associations to pass along helpful information.

Under this plan the National Association can devote more time to problems of national importance, and can maintain closer contact with local associations, which should give local associations and individual members more benefit from membership in the National Association.

"That the board of directors recommend to the Louisville convention an adjustment of dues, or per capita tax, in order to provide a sufficient income to permit carrying on the work of the association and to carry out plans for giving better service to our membership, and that the same committee prepare the recommendation and the necessary amendments to the by-laws;

"That we believe dues fixed on a graduated rate, based on the average number of men employed, to be a fairer method to both large and small shop owners than the present single rate.

"The rate of dues to be as follows:

"For a shop averaging three or less men per year the annual dues shall be $5; for a shop employing four to nine men, $15; and for a shop employing ten or more men, $25."

Another resolution presented dealt with the problem of peddling bids. This resolution read:

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that contracts in excess of $5,000 in amount for the construction, alteration, or repair of any public building in the United States shall be awarded only to bidders whose bids are accompanied by a statement containing the names and addresses of the subcontractors, material men, and supply men whose services the bidder intends to utilize in the performance of the work. Such contracts shall also contain provisions for payment by the contractor of liquidated damages for failure to utilize such subcontractors in the performance of the work. Sums assessed or paid as liquidated damages for such failure may be remitted or refunded by the Supervising Architect of the Treasury, but only in case it is shown to his satisfaction that substitution for a subcontractor was justified by reason of the inability or unwillingness of such subcontractor to furnish the materials or supplies, or properly to perform the work.

"Section 2. No claims for the remission or refund of liquidated damages shall be granted under this act unless application therefor is filed within one year after the liability of the contractor accrues. If any such application for refund of any sum paid as liquidated damages is denied, or if no application for such refund is filed within the period provided for filing application under this section, such sum shall be covered into the Treasury as miscellaneous receipts."

Addresses

The various papers presented during the sessions constitute a group of ideas which are worth thorough study by contractors. In order that these addresses may be studied we are publishing excerpts from them on another page of this report. In addition to those papers which are so reported, a number of other talks on subjects of timely interest are reported progressively.

OFFICERS TO SERVE UNTIL JANUARY, 1933

PRESIDENT
H. Stanyer.....Dallas, Tex.

FIRST VICE-PRESIDENT
M. F. Liebermann..Ambridge, Pa.

SECOND VICE-PRESIDENT
George C. Clark.....Chicago, Ill.

THIRD VICE-PRESIDENT
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Joseph C. Gardner..Indianapolis

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A. B. Rysdon.....Chicago, Ill.

TRUSTEES
Jules Gerock, Jr.....St. Louis, Mo.
J. E. Merrick.....Louisville, Ky.
Louis Luckhardt..Pittsburgh, Pa.

E. J. Russell

E. J. Russell, vice-president, American Institute of Architects, spoke the first day on the pressing need for better co-operation between the roofing and sheet metal trades and the architects and owners. "There is," said Mr. Russell, "a very close interest between all these groups. The building industry as a whole is and must be deeply concerned in the numerous problems of construction today. One method of ironing out differences and working together on a common plan to increase and better construction practices is for all interested parties to gather around a common table and discuss these problems. One method of accomplishing this would be for directors and boards of the national bodies to get together at stated intervals and discuss these problems and their possible solutions.

"Some of the things which should be worked out are the problems of uniformity of products, better estimating plans, improving present methods of submitting bids, and eliminating abuses now common.

"We need," said the speaker, "a closer co-operation between architect and contractor. The contractor should keep his specifications up to date and he should also make available for the architect literature and information on the latest uses of new and old products.

"Another pressing problem is the proper handling of sub-contracts. Too often these sub-contractor bids are peddled hither and yon until some foolish virgin is found who will cut the price and so get the job because the general contractor wants to make as large a profit as possible.

"Another important matter is that of making the contractor understand that most architects are not interested in guarantees, simply as guarantees, but want to know that the contractor submitting any bid be financially responsible and have a reputation for good work."

Robert D. Kohn

Included in the discussion of this

address was a paper prepared by Robert D. Kohn, president, American Institute of Architects. Mr. Kohn said in part:

"There is no more important indication of progress in the building industry than the concentration of different branches of the industry in joint conference bodies.

"Some of our more modern buildings require the employment of 30 to 35 different trades. How can we expect so complicated a process to go along harmoniously unless we develop an understanding of the interdependence of each craft on the others?

"From the point of view of the architect there are two things that a conference like yours can promote. Firstly, there is the principle of better and more efficient workmanship. We are all agreed that we do not want to see craftsmanship degraded. And, secondly, you can do much in the way of solving some of the problems of construction incident to our changing modern building methods. Those who are engaged in your particular industry—roofing contractors, sheet metal men and others—have a certain practical knowledge which is of great value. The architects of the country have certain other knowledge; namely, they know what they want to accomplish. These two must somehow supplement each other.

"It would be valuable if we might hear that you will develop some form of research or information bureau so that the valuable knowledge in your possession may be made available for general use."

George C. Bartells

Following some business matters on Tuesday afternoon, George C. Bartells, technical representative of the American Zinc Institute, discussed the new two-ounce zinc coating which the Institute is licensing mills to roll for exterior applications. A number of mills have already adopted this new sheet which will be marked with the Institute's Seal of Quality. In explaining the new sheet, Mr. Bartells pointed out that the trade has been using sheets with a much lighter coating and that as a result galvanized iron sheets have not withstood the action of the elements as they should.

The new sheet is already being marketed by a number of mills and others probably will offer the same sheet shortly, said the speaker.

John A. Pierpoint

John A. Pierpoint, national councillor to the Chamber of Commerce of the U. S. A., submitted his annual report outlining just what the chamber has accomplished during the last twelve months. The highlights of this report are:

"American business has a vital interest in stability of employment and in the possibilities of minimizing the disturbing effect of seasonal fluctuations. Several hundred American concerns at present are putting into practice employment regularization plans with a large degree of success.

"Employment regularization experiments have demonstrated unmistakably that the management of every sort of business enterprise can exert some measure of control over economic forces which produce intermittent unemployment. The committee of the Chamber, now giving attention to this subject, is exploring the possibilities of supplementing individual efforts at stabilization with a wider co-operative trade association effort. Undoubtedly present successful individual methods can be applied by whole industries. If a certain number of key industries could give their workers the assurance of uninterrupted employment and sustained earning capacity, they would set up against the recurrent waves of apprehension and uncertainty a formidable barrier.

"A bill to limit the equity jurisdiction of Federal Courts, known as the anti-injunction bill, made no material progress during the last Congress. The Chamber on several occasions has recorded its opposition to any legislation that would diminish the jurisdiction of the Federal Courts.

"Increasing burdens of taxation imposed by federal and state and local governmental agencies emphasize the need for scrutiny of the cost of government. Studies by the Chamber indicate that it would be practicable to save throughout the United States in the year ahead at least one billion dollars in public expenditures, which amounts to only 7 per cent of current totals, without impairing necessary governmental service.

"The exactions of the Federal Government upon the revenue of individuals and of business firms are already too great. To say that these taxes are too high is only another way of saying the government is spending too much. Any increase in the rates of Federal taxes in the coming year will be stoutly resisted. The possibility of securing modification of the capital gains tax and of improvement in the tax structure will be examined."

Riesmeyer Report

E. H. Riesmeyer submitted a report which was read in his absence in which he said that unless the warm air heating and sheet metal contractors in each locality get together and boost their business as a united organization some other industries will surely step in and take air conditioning away from us. This report also stressed the need for immediate action on such other problems as quality materials and products, standard methods of cost keeping and estimating and elimination of direct manufacturer selling.

Jack Stowell

As a part of the general discussion following the address of F. H. Mehrings, Jack Stowell, a contractor we all know, outlined his thoughts on this proposition of air conditioning. Jack told about the wonderful exhibits in Cleveland displayed in conjunction with the annual convention of the National Association of Heating and Ventilating Engineers and the National Refrigeration Engineers' Association.

He outlined the problems pertaining to the sale of unit equipment, the pressing problem of standard methods of doing the necessary enginering for forced air installations, and told of the progress made by the blower manufacturers in putting together a forced air code.

As he sees the situation there is immediate market for semi-air conditioning systems costing from one to two thousand dollars and a developing market for the same or similar equipment in homes of lesser value.

We should bear in mind, he also stated, that right now there seems to be a very definite market for improved gravity installations and that seemingly this gravity market, which is now our bread and butter, will always exist. We should not overlook this field in our enthusiasm for semi-air conditioning.

E. St. Elmo Lewis

Perhaps the most unique feature of the convention was the session conducted by E. St. Elmo Lewis on the subject "How Are You Going to Make More Money in 1932?" This problem was handled on a question and answer basis. Members were given a four-page printed questionnaire before the meeting. On this leaflet were listed a number of questions pertaining directly to the problems of making money. The idea was for Mr. Lewis to lead off the discussion by a brief summary and then throw the meeting open to general discussion of the questions assigned.

Space does not permit a detailed listing of the questions, but they were questions such as—"What new lines can the roofing, warm air heating man take on with the hope of making a profit on a fair investment." Answers to this question brought such replies as oil burners cannot, by and large, be taken on profitably, gas furnaces can and should be, and by all means play air conditioning for all it is worth.

Another question—"How are warm air men meeting the competition of steam, hot water, vapor?" brought such replies as—By letting the industry and the public know just what our system has to offer, what it can do through official investigations by the national association in the research residence. Also by each contractor doing intensive cultivation of the public's interest in air conditioning.

Still another typical question—"What is the most successful method of advertising your work?"—brought out experiences such as newspaper advertising is all right and brings results, billboard advertising is also good, direct mail, blotters have played an important part in getting the contractor's name before the public, radio has not been widely used, but brings results.

Many similar questions as well as questions relating to general and specific business problems were brought out and aired with gratifying results.

BE GUIDED BY THESE FIVE RULES

1. **Keep accurate cost records.**
2. **Study your market intensively.**
3. **Watch your credits closely.**
4. **Train your staff.**
5. **Build up your staff's morale and keep everyone, including yourself, confident in your business, your firm, and your future.**

Closer Cooperation in Our Trades

By CLARKE I. GEORGE

DO we need trade organizations in these days?

The trade organization is not a modern idea. There were artisan guilds in Europe as early as the 15th century. Of these guilds, constantly changing and developing, the present trade organization is the direct and natural descendant. Men in the separate trades do have an identity of interest. Their burdens are mutual, therefore they can be so much more easily borne if carried in common. If there is no common interest, then there is no basis for a trade organization.

But it is not safe to conclude that since there is no trade organization, therefore there is no common interest. The big probability is that there is no organization because the common interest, though there, is not recognized. Or it is recognized by only a few, and these few have grown weary and discouraged trying to carry the load for an industry most of whose members are willing to ride, but only if they can ride free.

The business world does believe in organization. In all likelihood, the material you use as a master employer is fabricated in a factory member of a manufacturers' association, sold through a member of a jobbers' association, specified by a member of the American Institute of Architects, and he, the master roofer, becomes a subcontractor for a general whose rights have been developed and protected through a uniform contract agreeable to the Associated General Contractors. But before he can erect this material into the building he has had to make his peace with a trade union, whose right to collective bargaining is fully recognized. What a chance for the poor unorganized subcontractors!

"Who is my competitor?" The natural answer on first thought is, "Why, it is Bill Smith, of course; that devil over on Main Street who wants all the jobs in town. We both handle the same grades of material, and how he can take jobs at such prices and keep going is beyond me."

So thought the village blacksmith. It was the other blacksmith in the town that he had to watch. And while they both enviously watched each other the auto repair shop grabbed off their business; and both blacksmiths closed up, because neither had early enough recognized their real competitor.

The Government favors the organization of the trades and promotes the efforts of associations in self-regulation and the formulation of rules for their own conduct, always with due regard for public interest.

In a radio talk on February 6, 1931, the assistant secretary of commerce, Dr. Julius Klein, after mentioning that the Department of Commerce is working with more than sixty committees representing hundreds of trade associations, said: "If we had to thresh out every question with all the individual units in an industry, the task would be, in most cases, gigantic and almost endless." Dr. Klein said further: "I hear some members of business bodies, talking, these days, about the possibility of resigning from the organization, with the object of supposedly saving money. I can think of nothing more dangerously extravagant than that—a wasteful squandering of that invaluable asset of good teamwork at the very time when collaboration is absolutely vital."

Let us catalog some of the important objectives for the trade association:

First: The formulation of trade practices, so that competition will be fair, so that the service will be efficient, and thus build up the industry, but at the same time protect the public.

Second: The collection and dissemination of trade statistics so that the members may conduct their affairs intelligently.

Third: The development of uniform cost accounting, or at least educating the members in the necessity of keeping accurate job cost records so that quotations may be controlled by experience, with most of the guessing eliminated.

Fourth: Research, for the development of new methods, new uses and markets for the industry's labor and product.

Fifth: Advertising, for the industry, removing unjustified objections and popular fallacies regarding the merchandise of the trade, holding the market against untried innovations and less worthy substitutions, and against the competition of other industries.

Sixth: Active interest in legislation, informing the members particularly on those matters affecting their trade, such as matters of taxation, lien laws, building codes, etc.

Seventh: Standardization of trade terms and definitions, enabling the buyer and seller to speak the same language.

Eighth: Joint effort in raising the industry to a high plane in the esteem of the public, by the development of better ethics and genuine honesty so that the architect and buyer may deal in confidence with the association member.

Ninth: Furnishing a medium for the exchange of helpful ideas, those that will increase the ability of all its members to give better service to their customers.

Trend of Association Activities

By GEORGE I. RAY

THOSE of us who are regular in our attendance at National organization conventions know that it is well worth the time and money invested. We, collectively, have controlled principles and policies to a certain extent and have established precedents and standards that have had a far-reaching influence in the past.

The issue now is to maintain the loyal cooperation and support of the individual. We all realize that something drastic must be done to sustain organizations. This can be done only through co-operative effort from all national organizations.

I had the privilege of meeting with 14 associations in September at the call of the president of the A. I. A. in Washington to see what could be done from an associational standpoint to correct the evils that exist in the construction industry. The prevailing opinion at this meeting was that unless the architects would join in with all building interests, correcting abuses through specifications, it will be impossible to correct them. As this did not seem practical, it was decided that the construction units of America should be organized on principles that will take in every phase of construction, and such a plan was presented for ratification by the coming conventions of all allied trade associations in the construction industry.

I personally would not be surprised if concerted action were taken by our present Congress towards correcting existing laws which prohibit businesses making agreements to offset the devastation that is allowed by the present laws.

A movement is now on foot to correct such legislation, and it is up to individuals and associations to join in the movement to bring these matters to the attention of our representatives in Congress and have them foster such legislation as will put business on a more serviceable and profitable basis.

If such laws are modified they will enable you to enter into agreements that will insure a legitimate profit to the industry as a whole, as well as to the individual, and allow your association to operate on a basis whereby pressure can be brought to bear on the individual to practice and perform on a basis of profitable and economical business, it will be the elimination of the irresponsible and will put association membership on a higher plane than has existed in the past.

Applications for membership in associations would be given only when the applicant can substantiate his position as to responsibility, integrity and service. Until associations work toward the point of prequalification in all trades it is not reasonable to expect that the cream of the industry will align themselves with a loadstone on their neck, which is the irresponsible individual.

Progress should be the keynote of every association, but unless action is taken concretely toward co-operative effort to obtain such legislation as is needed to correct prevailing abuses, the future holds nothing for associations. Any imaginative mind can visualize what the future could be if associations had power to hold their memberships to principles and to compel the destructive competitor to play fairly.

If business is to be taxed on its income it must be allowed to live and prosper and enter agreements that insure a nominal profit.

You and I in our individual business are small, but collectively we are a large factor. Unless business principles are enacted into organizations the time is not far off when organization will disappear. We have gone as far as we can with the pressure of educational efforts and on voluntary co-operation. We must put teeth into our plans. It's too bad—but we must police these non-co-operators with authority if we are to completely achieve the climax of co-operative, economic control of business industry and trade in this country.

If this national annual conference idea meets your favorable reaction, we believe those state associations adjacent would do well to consider holding their annual meetings at the same time and place. This would reduce the time and traveling expense very considerably and eliminate the call upon manufacturers and distributors for double or extra exhibition and entertainment expense.

Problems of the Construction Industry

By THOMAS T. FLAGLER

IT is obvious all is not well with construction. I cannot speak for anybody but myself when I say that there is an insufficiency of business, but if you gentlemen feel the same way about it, let me repeat the assurance that this depression has seen its worst.

Construction suffers from many ills, some of which it is in our power to correct and others which must wait for correction on a voice which can speak for the industry as a whole. To illustrate what I mean let us take one of the simplest construction projects.

Construction financing, as it has been largely practiced for many years, has much to be ashamed of, and construction finance is not entirely to blame. Our government creates a Federal Reserve Bank and does not let any of our construction paper by any chance get into it. I claim that a man with a job and with a long record of earnings and with a part of the cost of a house and lot in the bank is of right entitled to borrow the remainder on as fair and liberal terms as a great industry which seeks to finance itself through the sale of stocks and bonds to the public where the business of this industry is based on installment selling to a less responsible public.

It is encouraging to note that at this particular time our government is earnestly considering clarification of these problems and seems to be taking steps towards their relief. But you will note these steps were not taken until unsound financial practices and lack of financial planning had so depressed the values of buildings that the large moneyed interests were involved.

The average general contractor wishes to treat the subcontractor and the material dealer with fairness, but he is operating in a market which in many ways is unfair to him. The general contractor secures most of his business in the field of unrestricted, cut-throat competition. Bidding lists on the whole include the responsible and irresponsible, the efficient and the inefficient, and if a good contractor is to keep his business going he must base his bid not on the sub-bid which he would like to use, but on the bid which he knows his competitor will use.

So long as the number of dollars is the only consideration in awarding construction contracts, so long will this condition maintain, unless the various independent elements in constructiton get together and eliminate it. That there is a solution to the problem I most earnestly and devoutly believe, and that the goal will be reached only when the step towards cooperation which you are taking in this conference will have expanded to a point where it becomes as wide as building industry itself.

Air Conditioning

By F. H. MEHRINGS

"THE next Big Change" is the way air conditioning has been characterized by a feature article in one of the leading specialty magazines of the advertising and selling field. And when some new development gets into the spotlight of public interest as has air conditioning, to the extent that publications such as the Saturday Evening Post, Good Housekeeping, and Cosmopolitan, and metropolitan newspapers, take important note of it, indeed it is time the industry most directly affected should wake up to its possibilities.

The industry referred to is manifestly the heating industry. And when it comes to warm air heating, the important part played by the sheet metal contractor has caused warm air heating and sheet metal contracting to become synonymous, even though many a first-class sheet metal establishment has long since abandoned warm air heating as unimportant and unprofitable.

As far as the public is concerned, air conditioning is something to be desired for the home because it is already being enjoyed in theaters and other public places. It is my humble opinion that if our industries do not grasp this opportunity a brand new industry will spring up and we shall be left "out in the cold."

The sheet metal contractor is well fitted for the kind of work of which a great deal will be required on every air conditioning job. Moreover (and although this is going to be hard on the manufacturers of standard pipe and fittings for warm air furnace installations, it is nevertheless a fact), the air conditioning job gives the sheet metal contractor more than merely the labor of installation, as every job, being practically "tailor-made," provides additional work for the local shop, because it is far more practical to make up the duct work locally or on the job, to exactly meet building conditions and requirements, than to attempt to install ready-made material. Herein lies a real opportunity.

That air conditioning has arrived can no longer be doubted, for one hears of it wherever one goes, and it is only to be regretted that our industries, to which this new development rightfully belongs, are not better prepared to take advantage of the opportunity, for not only is there an ever-growing interest on the part of the public, but a demand already exists and wide-awake contractors are capitalizing it.

What is the true meaning of air conditioning—what is it, and also what is NOT air conditioning? True, any systems by means of which the air is changed in any way might be termed an "air conditioning system," but in its true sense an air conditioning system is much more than an ordinary heating plant with the addition of a fan that is supposed to move the air. Unless those who have the interests of the industry at heart will do their utmost to promote the maximum rather than permit a very minimum to creep in, the new field will be robbed of its profit possibilities due to ever lowering standards of practice, with the result that the public will become "sour" because this thing called "air conditioning" did not measure up to expectations.

Briefly, an air conditioning system should consist of a good warm air furnace of adequate size and capacity, a fan or blower to insure circulation to all the rooms under all conditions, together with means for thoroughly cleansing and properly humidifying the air. Equipment for complete automatic control of temperature, humidity and circulation adds to the profit and satisfies the customer.

While the opinion seems to prevail that summer discomfort must be endured, this is just another phase of the opportunity, for air conditioning of the home in summertime is to be desired. Air conditioning systems designed principally for wintertime service also can be made to serve most admirably in summer.

Moreover, air conditioning presents our first opportunity to compete with all other systems of heating, because the air conditioning contractor is able to get an audience with the architect and builder of the better class of homes where steam or hot water heating has been a foregone conclusion. Whereas warm air heating had come to be looked upon as decidedly inferior, now, because it lends itself so well to the adaptation of air conditioning, this good old system is coming back into its own.

It may be well to point out the features of design and installation that have come about in the past two years or so. There is, first of all, the apparatus required to perform automatically the four necessary functions. Such apparatus may now be had in a variety of sizes and styles, and to burn gas, oil or coal. External appearances are now sufficiently attractive to grace the most modern of modern basements.

To condition the air is one matter—to place it in the various rooms of the house is quite another. Most duct work now used in connection with air conditioning installations is rectangular in cross-section. Trunk line systems and individual run systems both have their advocates. Another school employs round ducts with extremely high velocities and very small pipes.

Return air is now taken from practically all parts of the house. With forced circulation it is especially necessary to return the air directly from the second floor; otherwise objectionable drafts will be found on the stairways. Architects are co-operating with the contractor so that ducts may be run in the joist spaces or false ceilings constructed. Registers and grilles are now offered in designs which are small, unobtrusive and attractive in appearance.

The Louisville Exhibits

ENTERPRISE BOILER & TANK WORKS, CHICAGO, ILLINOIS

Products Displayed: Pure-Air double weld steel furnace displayed.
In Attendance: Fred Goodall, Manager Furnace Division.

HETZEL ROOFING PRODUCTS COMPANY, NEWARK, NEW JERSEY

Products Displayed: Elastic roof cement, roof paints, roof coatings and "Acoustiglu" were displayed.
In Attendance: Thos. A. F. Baudermann, Sales Manager.

THE WILLIAMSON HEATER COMPANY, CINCINNATI, OHIO

Products Displayed: DeLuxe comfort system conditioned air unit occupied this booth.
In Attendance: W. L. McGrath, Vice-President and General Manager; P. W. Beach and W. L. Marshall, Salesmen.

INTERNATIONAL NICKEL COMPANY, NEW YORK CITY

Products Displayed: Exhibit of Monel Metal in mill forms and a large display of co-operative sales literature that is available to sheet metal contractors who are interested in going after Monel Metal business.
In Attendance: A. H. Galley.

CERTAIN-TEED PRODUCTS CORPORATION, NEW YORK CITY

Products Displayed: Asphalt Roofing shingles and siding.
In Attendance: Walter G. Cowan, District Manager; W. C. Hendricks, Sales Manager, and G. V. Fuller, Sales Promotion.

CHRISTIE CLEANER COMPANY, COVINGTON, KENTUCKY

Products Displayed: Christie Cleaner.
In Attendance: H. W. Jenish and C. R. Gottschalk.

BIRD & SON, INC., EAST WALPOLE, MASSACHUSETTS

Products Displayed: Full line of roofing products.
In Attendance: J. DeBerg, Manager Build-Up Division.

BARBER ASPHALT COMPANY, PHILADELPHIA, PENNSYLVANIA

Products Displayed: Genesco Trinidad Asphalt built-up roofs and Genesco roofing and shingles.
In Attendance: Joe L. Rosborough.

LUDOWICI-CELADON COMPANY, CHICAGO, ILLINOIS

Products Displayed: Roofing Tile.
In Attendance: C. I. Carspecken, Indianapolis representative, and W. A. Brockett, Cleveland District Sales Manager.

BENJAMIN FOSTER COMPANY, PHILADELPHIA, PENNSYLVANIA

Products Displayed: I. B. M. roofing products—asphalt plastic cements, coatings and paints in black and colors.
In Attendance: Benjamin Foster, Sr., President; J. T. Mooney, Sales Manager, and T. H. Darrah, Salesman representative.

PARKER-KALON CORPORATION, NEW YORK CITY

Products Displayed: All products manufactured by this company.
In Attendance: C. J. Martin, Assistant Sales Manager.

DAVID LEVOW, RIVAL STRAP CORPORATION, INTERLOCKING FLASHING CORPORATION, ALL OF NEW YORK CITY

Products Displayed: Fitrite Pipe Snowguards actually installed on a slate roof, Fitrite Gearing, Fitrite Bronze Strainers, also baffle plate ventilator used on U. S. Post Office. Interlocking Flashing Corp. displayed an actual brick wall with flashing built in.
In Attendance: David Levow.

PAUL R. JORDAN & COMPANY, INDIANAPOLIS, INDIANA

Products Displayed: Aeroplane Rotary Ventilator, Jordan Fan Ventilator, Jordan Kitchen Fan, Aeroplane Ceiling Fan, Chicken House Ventilator, Jordan Attic Ventilator, Portable Pipe Booster and Jordan Siphon Ventilator.
In Attendance: Paul R. Jordan and C. E. Woolen.

THE AMERICAN ROLLING MILL COMPANY AND THE ARMCO DISTRIBUTORS ASSOCIATION OF AMERICA, MIDDLETOWN, OHIO

Products Displayed: Armco Ingot Iron.
In Attendance: Bennett S. Chapple, Jr., Managing Director of the Association.

THE FLINTKOTE CORPORATION, NEW YORK CITY

Products Displayed: Asphalt Shingles, Asphalt Felts, Cotton Saturated Fabric and Asphalt Emulsions.
In Attendance: J. F. Swartz, R. L. Duncan, and J. W. Thompson.

JOSAM MANUFACTURING COMPANY, CLEVELAND, OHIO

Products Displayed: Roof drains for flat and saw tooth roof construction, vent stack sleeves and overflow scuppers.
In Attendance: M. J. Hirshstein, Director of Sales Promotion.

CORK IMPORT CORPORATION, NEW YORK CITY

Products Displayed: Novoid Corkboard Insulation.
In Attendance: A. R. Wienke of the Chicago office of this company.

COPPER & BRASS RESEARCH ASSOCIATION, NEW YORK CITY

Products Displayed: Publications and literature on copper and its alloys.
In Attendance: William M. Crane, Jr., and Philip Q. Sawin.

AMERICAN AIR FILTER COMPANY, LOUISVILLE, KENTUCKY

Products Displayed: Air Filters. Four types of furnace filters, two employing viscous coating and two types of dry filters, filters for general ventilation, and dust arrester service.
In Attendance: Wm. K. Gregory, Division Sales Manager; W. G. Frank and G. W. Sontag, Assistant Sales Managers.

THE RUBY CHEMICAL COMPANY, COLUMBUS, OHIO

Products Displayed: Rubyfluid Soldering Flux.
In Attendance: G. C. Baker, Secretary-Treasurer.

ARMSTRONG CORK INSULATING COMPANY, LANCASTER, PENNSYLVANIA
Products Displayed: Temlock Insulation, with other varieties of roof insulation.
In Attendance: L. E. Cover and F. K. LeRoy.

REPUBLIC STEEL CORPORATION, YOUNGSTOWN, OHIO
Products Displayed: Toncan Copper Molybdenum Iron and Endur Stainless Steel.
In Attendance: C. L. Bailey.

OWENS-ILLINOIS GLASS COMPANY, TOLEDO, OHIO
Products Displayed: Dustop Air Filters.
In Attendance: Frank L. Myers, Sales Engineer.

WHITNEY METAL TOOL COMPANY, ROCKFORD, ILLINOIS
Products Displayed: Punches and shears, foot press, angle iron shears and dropped forge hammers.
In Attendance: Gus Jensen.

THE AMERICAN BRASS COMPANY, WATERBURY, CONNECTICUT
Products Displayed: Anaconda Sheet Copper, Everdur Spandrels, nails, bolts, screws and sheet metal.
In Attendance: F. R. Drake, Assistant Exhibit Manager; J. W. Stoner, Assistant Manager of Sales; H. F. King and Ralph Taylor.

PAYNE FURNACE & SUPPLY COMPANY, BEVERLY HILLS, CALIFORNIA
Products Displayed: Gas furnaces and circulating heaters.
In Attendance: O. W. Wagner.

NATIONAL SLATE ASSOCIATION, PHILADELPHIA, PENNSYLVANIA
Products Displayed: Roofing slate, flat and sloping roofs. On lobby side—complete roof section of various colors and grades were shown illustrating closed hip, round and closed valley slate ridges and a metal valley. Also on the exhibit side of booth roof sections were exposed showing method of laying slate, both standard and American, graduating roof dutch lap. Literature on the uses of slate were distributed to the public, visiting architects and contractors, together with a sheet giving the list of the active producers which sponsored the display.
In Attendance: W. S. Hays, Secretary, and Marguerite Senf.

H. EIKENHOUT & SONS, GRAND RAPIDS, MICHIGAN
Products Displayed: Roofing tools.
In Attendance: John Eikenhout.

B. MIFFLIN HOOD COMPANY, DAISY, TENNESSEE
Products Displayed: Tile roofing.
In Attendance: B. M. Hood, G. K. Fackler, A. V. Weise and J. C. Larrimore.

JOHNS-MANVILLE, NEW YORK CITY
Products Displayed: Roofing materials.
In Attendance: J. M. Berdan, Mr. Elliott and Mr. Wilson.

LITTLEFORD BROTHERS, CINCINNATI, OHIO
Products Displayed: Roofing heaters.
In Attendance: John J. Strobel and H. M. Orschel, Chicago District Sales Manager.

THE RUBEROID COMPANY, CHICAGO AND NEW YORK
Products Displayed: Asbestos cement shingles.
In Attendance: Thomas Dantz.

THE CINCINNATI SHEET METAL AND ROOFING COMPANY, CINCINNATI, OHIO
Products Displayed: Furnace Pipe and Fittings.
In Attendance: R. R. Roth.

U. S. PRESSED STEEL COMPANY, KALAMAZOO, MICHIGAN
Products Displayed: U. S. Steel Furnace.
In Attendance: C. V. Brown, President, and Mr. Watson.

LANGENBERG MANUFACTURING COMPANY, ST. LOUIS, MISSOURI
Products Displayed: Front Rank Furnaces.
In Attendance: Mr. Walters and A. F. Fanning.

KEASBY AND MATTISON COMPANY, AMBLER, PENNSYLVANIA
Products Displayed: Asbestos products.

NEWPORT ROLLING MILL COMPANY, NEWPORT, KENTUCKY
In conjunction with The Globe Iron Roofing and Corruglating Company, Cincinnati. Products Displayed: Sheet metal building products and Gohi sheets.
In Attendance: E. W. Riefkin.

THE MEYER FURNACE COMPANY, PEORIA, ILLINOIS
Products Displayed: Complete air conditioning unit along with the Weir line of furnaces.
In Attendance: Frank E. Mehrings, J. F. Flavelle, George Meyer and Mr. Kelly.

F. MEYER & BRO. COMPANY, PEORIA, ILLINOIS
Products Displayed: Furnace pipe.
In Attendance: George Harms.

WHITNEY METAL PRODUCTS CORPORATION, RICHMOND HILL, NEW YORK
Products Displayed: Conductor hooks.
In Attendance: M. Rachlin and Philip Luchs.

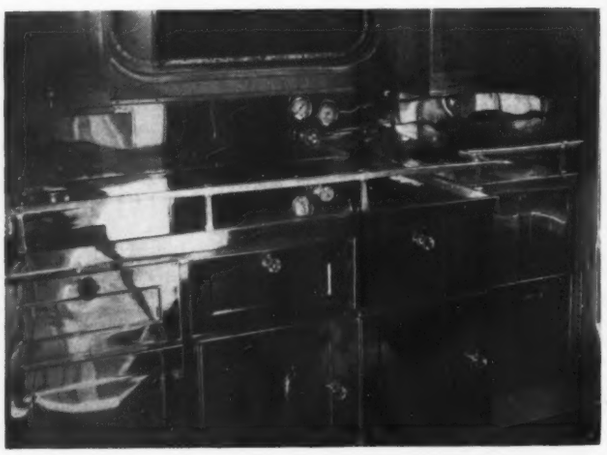
REVERE COPPER & BRASS, INC., NEW YORK CITY
Products Displayed: Revere Copper and Brass Products.
In Attendance: E. W. Norman, R. Weil, John R. Lumm, W. W. Wardwell and R. H. Binns, Jr.

C. G. HUSSEY & COMPANY, PITTSBURGH, PENNSYLVANIA
Products Displayed: Copper and brass products.
In Attendance: Rrank J. Ruehwein.

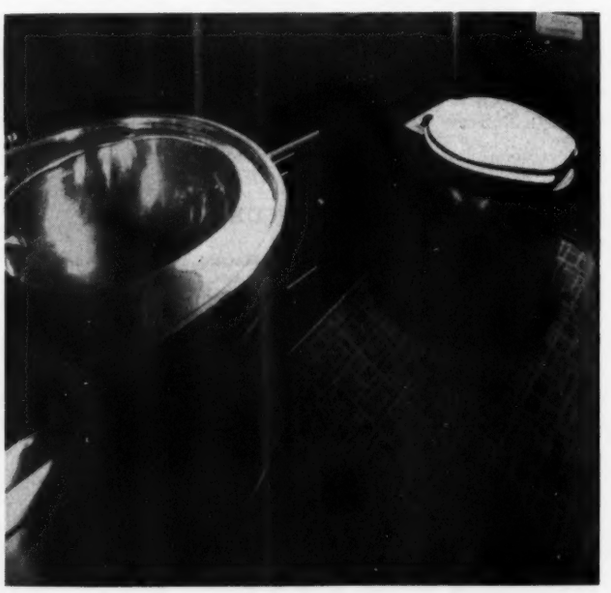
THE BARRETT COMPANY, NEW YORK CITY
Products Displayed: Roofing products.

Metal Serves the Air Transport Industry

HERE'S a case where a progressive sheet metal worker actually hitched his business wagon up in the sky—though not exactly to a star. The Builders Sheet Metal Works of Seattle installed this Monel Metal galley and lavatory equipment in a Boeing air cruiser built for the Standard Oil Co.



At the right is one end of a metal lined wash basin and a metal closet. Lightness and permanence were the reasons for chosing metal



At the left is a combination sink, stove, refrigerator, table all metal fabricated. Meals are prepared and served from this compact galley

The Indiana Convention

THE first state convention of the warm air heating and sheet metal industries to be held this year was staged by the Indiana Association in Indianapolis, January 19, 20 and 21. Those who attended were unanimous in the declaration that the convention, all things considered, was highly successful.

In several ways the Indiana convention was a departure from former practices. First of all, the meetings were closed to visitors. This meant that only members of the state organization and affiliated organizations were permitted in the meetings. Second, a drive was made to get as many contractors as possible to the convention. That this drive was successful is shown by attendance records which listed 123 contractors. This contractor attendance equals that of any former year. The displays, which are an annual feature, were not as well patronized as formerly, but exhibitors declared themselves satisfied with the interest and business shown.

Business Sessions

The business sessions of the convention were marked by their general interest. Perhaps the most important piece of business accomplished was a revision of the association's by-laws to include a section outlining definitely the many things which our industries claim jurisdiction over in construction work.

This resolution was proposed by Chas. Rundall of Ft. Wayne. Mr. Rundall stated that this matter of jurisdiction had been brought to a head in Ft. Wayne and that the local association had found it necessary to outline just what work our two industries claim to do. As a result of getting this jurisdiction claim adopted in Ft. Wayne, he considered it important that the state association include a similar section in the state by-laws.

According to custom, a new slate of officers for 1932 was presented by the nominating committee. The officers elected by unanimous vote is listed in an adjoining column.

Another important piece of business was a resolution presented by J. E. Merrick of Louisville. This resolution deals with the relationship between general and sub-contractors. The gist of the resolution is to the effect that general contractors shall be compelled to submit with their bids a copy of the bids submitted to them by sub-contractors. Also that the name of the sub-contractor shall accompany his bid. Also that on government work all projects costing over $50,000 shall be prepared by architects outside of the government.

The Program

Tuesday was devoted to the opening of the exhibits and registration, also the meetings of some committees. On Wednesday the convention was called to order by President H. A. Beaman, who introduced R. A. Mahoney of Sheet Metal Worker, who read the talk Edward A. Scott, editor, was unable to deliver in person due to sickness. The high points of this address were:

"There never was a time, I believe, when business men generally have taken their business so seriously as at the present. Gratifying as this condition is, there is room for a more serious effort. There are still too many business men waiting for things to get better rather than doing what they can and should do to make things better for themselves.

"There are increasing indications that the tide in business is turning, and 1932 promises to be a better year on the whole than was 1931. We might ask what a sheet metal contractor can and should do to take his business more seriously. The answer to that question depends largely upon what he has been doing heretofore to develop his business.

"It often seems that many men in these industries do not spend as much time as they should in studying and planning. A campaign for business must be planned in advance just as necessarily as must a military campaign. If it appears that there will be little new building in a particular locality, then it is quite evident that the sheet metal contractor should conclude that he will have to depend for repair and renewal work, and if he is taking his business seriously he will plan his business-getting efforts accordingly. On the other hand, if there is considerable new work in prospect, he will include in his plans ways and means of obtaining his share of the sheet metal, heating and ventilating work in connection with such buildings.

"Another angle to this thought of taking business more seriously is along the lines of obtaining and using information. It is unfortunately a fact that many sheet metal contractors have not had the opportunity to acquire anything like complete information on the various phases of their work before engaging in business for themselves. That, however, is no just reason why they should neglect the opportunities to obtain that information as they go along.

"Throughout the country the public knows of the possibilities of better air conditions in the home, and many are looking forward to the day when this modern equipment will be installed in their home to provide more healthful heat during the heating season and cooling in the summer.

"But the demand for air-conditioning equipment will be so insistent and the possibilities for profitable business so promising that there is bound to be attracted to the industry contractors from other fields who can and will make such installation. It is a lamentable fact that men should be engaged in the heating industry throughout their entire career and know so little about heating as some men do. There are men engaged in the manufacturing of heaters, men in the sales departments, and dealers who do not understand the B.t.u. method of designing a heating system.

"Business generally is going to be more difficult. It will require more knowledge and more ability. A man with a little knowledge and experience could get by in practically all gravity heating work, but he would indeed be a brave man who with little or no knowledge would attempt to design and install a modern gravity air-conditioning system.

"The course for men to pursue, if they would be successful, is then clearly defined. A definite objective should be fixed. A business policy should be adopted. Business-getting methods should be carefully planned and diligently executed."

Geo. C. Joslin

Following Mr. Mahoney, Geo. C. Joslin of Tanner and Company, Indianapolis, discussed "Developing Business in Sheet Metal Lines." Of the many sound ideas presented perhaps the necessity of developing merchandising ability struck closest home. In opening his address Mr. Joslin read four pertinent slogans which he said we might adopt. These slogans were:

"You have to run like the devil to stand still these days."

"Stand still and perish."

"Run and compete."

"Sprint and lead."

These slogans, Mr. Joslin pointed out, are strictly 1932 admonitions. He showed how the pace today is getting faster. Every industry is after the public's dollar and the industry which gets the money is the industry which runs the fastest to get there first. In this present day competition, Mr. Joslin claimed the manufacturers have shown the most progressive ideas. "They have given new metals, have shown how to use these metals. They have perfected new and money saving machines. They have brought their products to a state in line with the public's demands and needs. All that remains, then, is for the contractor to

1932 OFFICERS

President—O. Voorhees.
1st V. Pres.—C. C. Sieb.
2nd V. Pres.—Cleve Branham.
Treas.—Tom Ewing.
Secretary—Homer Selch.

Directors

H. A. Beaman.
Elmer Livezey.
W. S. Waters.

District Governors

Gary—C. L. Gatz.
South Bend—J. A. Harris.
Muncie—Delbert Dawson.
Ft. Wayne—Chas. Rundall.
Indianapolis—Elmer Mullin.
Terra Haute—Gus Hartman.
Lafayette—W. F. Strate.
Bloomington—Louis G. Heitger.
Vincennes—Jos. Meyer.
Columbus—J. R. Everroad.
Richmond—Nelson Miller.

make use of these new and improved tools for getting business."

A number of very definite changes should be made today, stated the speaker. One of these is the matter of lumber dealers handling products which rightly belong to the sheet metal man. These lumber dealers are selling steel windows, galvanized iron and tin roofing sheets, all sorts of furnace fittings. So are the hardware merchants. And these products should be sold and installed by the metal contractor. "What," asked the speaker, "are we going to do about this?"

There is, stated Mr. Joslin, a too plentiful supply of labor and an under supply of new equipment.

In order to make use of the supply of labor, Mr. Joslin suggested that both warm air heating and sheet metal contractors give more of their time to merchandising — selling — in other words, and leave shop operations to the mechanics. "We need," he said, "to develop our selling ability. Practice is all that is needed. It doesn't require high pressure salesmanship, but rather a knowledge of what we can do and plenty of nerve to get out and ring door bells."

In this connection the speaker suggested that there is striking need for better systems of follow-up for prospects and old customers. A year 'round file should be kept and customers and prospects called on at stated intervals. We should have better collection services. Collections are harder to bring in, so more letters, more calls, more use of the phone must be adopted.

J. E. Merrick

Following Mr. Joslin, J. E. Merrick, president of the Louisville association, spoke as follows:

"I assure you that it is a real pleasure on the part of the Sheet Metal Contractors of Louisville to come to your splendid city and in our humble way contribute our mite towards the success of your meeting.

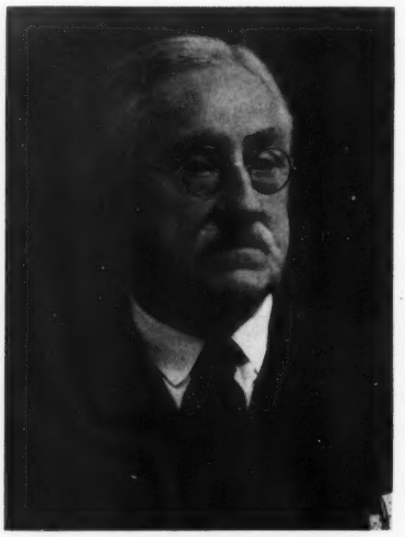
"All conditions, whether for good or evil, are prompted by some cause, and as the present condition of mankind is far from being desirable, I have chosen a subject in the hope of arriving at the root or origin of our present condition. This subject is: 'Present conditions —a way out.'

"I, like yourself, have many times heard that prosperity is just around the corner, but it is a matter of common knowledge that we are living on a sphere which has NO corners.

"It is, of course, needless for me to remind you that throughout the entire world a condition exists, unparalleled in the history of man. With unlimited natural resources, with the soil producing more than ever before, with the facilities of industry keyed to a high point in efficiency of production, the ability to supply society with all the necessities, comforts and even luxuries of life, we find millions of men and women out of employment, many of whom are badly in need of food, clothing and shelter. Many men who were wealthy two years ago are today without a dollar; others, who after years of thrift and personal effort, were anxiously looking forward to the day when the last payment would be made upon the home in which they lived, have been forced to sacrifice it; and still others, who were fortunate enough to save their homes, are unable to keep up ordinary repairs.

"Varied and numerous have been the views expressed as to the cause of this crisis: the World War, reckless speculation, frenzied finance, high-powered salesmanship, installment purchasing, over-production, under consumption and many other things. These have undoubtedly had a contributing influence—but, underlying all these is a great Dynamo, that which generates the power and moves all the others to action—Greed, with a capital 'G' and Selfishness with a capital 'S'; Greed and Selfishness that lead to a total disregard for the rights and the privileges of the other fellow; Greed and Selfishness that is manifest not only in our individual lives, but in the lives of the nations themselves.

"A way out, and I firmly believe, the only way out, is for all nations and all people who



O. Voorhees, 1932 President

comprise them, to dismantle and destroy that Dynamo of Greed and Selfishness and to erect, in its stead, one that generates the policy of live and let live and establishes the principles of the Golden Rule, not only in our acts as individuals but in our national life as well; to restore trust and confidence in the people and in our government itself; to establish such legislation, both state and national, as will properly safeguard the funds deposited in banks and prohibit the use of such funds for any purposes other than legitimate, commercial purposes such as the manufacture and production of commodities essential to humanity and leading to an ever increasingly higher standard of living, thus providing a means of reducing unemployment and increasing the purchasing power of a greater number of people.

Karl Roth

An address of interest was given in the afternoon by Karl Roth, of the Braden Manufacturing Company, Terra Haute on, "Metal Roofing." Mr. Roth said:

"It is my honest belief that sheet metal contractors all over this country have not given enough attention to sheet metal roofing, more particularly for farm use.

"Galvanized roofing, particularly for farm buildings, has peculiar advantages that no other roof covering possesses, such as saving one-half to two-thirds of the sheathing lumber. It is fireproof and absolutely lightning proof when corners are properly grounded and 90% safe from lightning with no corners grounded, neat in appearance, easy to apply, can easily be painted any color, and gives clean cistern water which is quite a factor in some localities.

"The use of galvanized roofings has been very materially restricted, due to the very poor quality of galvanized sheets made for roofing purposes. Unfortunately, it seems to be the belief of some steel mills that any sheet is good enough for roofing, when the truth of the matter is that only the very best, heavily coated, is good enough for roofing purposes. Its entire surface is continually exposed to the weather and is there for everybody to see.

"I am happy to say that there is now a move to bring galvanized roofings back. The American Zinc Institute is fostering a special brand of galvanized sheets for roofing purposes, to be known as the 'Seal of Quality' brand. All sheets are to be full weight 28 and 26 gage, with a guaranteed coating of 2 ounces per square foot. The American Zinc Institute will license sheet mills to make this brand, each sheet to be stencilled with the 'Seal of Quality,' and in addition each licensee will be required to place its brand on each sheet.

"What we need is a full weight, heavily coated galvanized sheet at not too high a price and the galvanized roofing business should increase by leaps and bounds."

A. C. Selvig

A. C. Selvig, Indianapolis, president of the Furmets, was called on to explain the relationship of Furmets to contractors. He asked for loyalty to the salesmen, who are in turn loyal to the contractors of Indiana.

Stokers

The concluding feature of the Wednesday program was a round table discussion of stokers and stoker sales led by Wayne Turpen, Standard Metal Company, Indianapolis. Mr. Turpen pointed out that in some districts stokers are now definitely a part of heating. While stoker sales have been heaviest in industrial applications, homes are adopting the stoker idea and eventually the residential field will be the biggest field for the sale of stoker units.

Platte Overton

The first speaker Thursday morning was Platte Overton, Chicago, consulting engineer and engineering editor of American Artisan. The highlights of his talk follow:

"I pointed out in a recent article in 'American Artisan' that if you placed a water pan in the casing of a gravity warm air system you could improve the job. It is possible to install a fan and force the warm air into distant rooms. Another improvement. Filters may be installed to remove the dust and dirt; further improvement. One of these items or all of them may not constitute air conditioning. Manufacturers have taken a gravity furnace of ancient and honorable lineage, concealed it under a square casing, painted it to shame Solomon in all his glory, attached a so-called blower with a wheel like a Mississippi river boat, and lo and behold! we have a complete air conditioning plant. Oh, yeah!

"The question, 'What reason have you to believe that the average man will ever pay $600 to $1200 for an air conditioning system in his home?' is frequently asked the speaker. The questioners are probably stand-patters; men who have spent a lifetime in the 'hot air' furnace field. They have seen the trend of the furnace industry from the old style furnace poorly installed at a good profit down to the modern warm air gravity heating plant well installed for less than cost.

"Now the ultimate consumer had nothing to do with setting the price. As a whole, he does not know if a gravity furnace installation is worth $150 or $300. He comes to the contractors to buy comfort, warmth, health and happiness. This home owner is not interested in grates or castings or sheet steel. Codes, charts, warm air associations and B.t.u.'s mean nothing to him, so the contractor talks to him about them. The contractor harangues the prospects on the 'thisness' of a steel furnace that later will be matched by his competitor on the 'thusness' of a cast heater. The befuddled home owner listens for a day or two and not having the faintest idea of what it is all about, buys the furnace at the lowest figure submitted.

"If I were to call on a prospect today and tell him the story of air conditioning, I should like to leave him some piece of literature to carry on my story after I had left. It would not be a catalog, but a simple folder, say 9 x 15 or 16, with a full story in pictures presented to him when he opened it up. It would show the corner of a living room well decorated with radiators where available space should be. The walls would show the black streaks of a win-

ter's heating and a $150 chair about to fall to pieces. The curtains and drapes would be shrieking for a trip to the cleaners, and the rugs begging to be taken to the cleaning shop, where they return with five years removed from their lives.

"Then the picture of the solution. No radiators, small, inconspicuous openings under the windows or high in the side walls, clean wall drapes and rugs, no dusting to do, no bills for redecorating for years. The picture of a living room with a bridge table and four players with their coats on. Ninety-five degrees outside, 80% relative humidity, 75-80 degrees inside, 40% relative humidity.

"Pictures comparing the modern tiled bathroom with that of 30 years ago, pointing out that the direct heating system is in the same class as this passe bathroom.

"A few well-chosen words comprehensive to the owner about health, heat, humidity, remarks about the appeal to the housekeeper who must keep this home clean. No dust, dirt or odors. The cost? Point out that he spends $700 to $3000 per year for automobiles, $1500 for tile work in bathrooms where we spend not to exceed one hour per day, $300 to $3000 for a fireplace, used ten times per year at the most, $1000 to $9000 for a roof, $5000 to $50,000 for furnishings. The air conditioning plant he can use 24 hours a day, 365 days per year.

"Carry this slogan pasted in your hat, in your cuff, in your mind, and get 100% saturated with it.

" 'The heating plant which only heats is no longer adequate.' "

Paul R. Reed

This address was followed by Paul Reed, editor of Warm Air Heating, St. Louis. His principal points were:

"It is evident that no set formula or no one procedure will fit the needs of every warm air heating dealer. Perhaps the quickest way is to determine the average qualifications and interest of the warm air heating dealer and then build from that a program of practical assistance, a program which must be within the capacity of the average dealer to assimilate and to apply in his daily business. In this task the trade paper plays an important role.

"The trade paper is performing a singular, unduplicated function in the warm air heating industry. There are four sources from which the dealer may draw information.

"The best and proper function of the trade paper, as I see it, is to act as a co-ordinator of the three factors, experience, manufacturer and trade activities and public interest. In acting as this co-ordinating link, the trade paper can do three things.

"First, it can keep the dealer supplied with a fund of information on the technical and merchandising developments within the industry, and at the same time supply him with a general fund of information which will not only be useful to him in his daily work, but which will build a desire and determination to improve himself.

"Second, the trade paper can raise the individual ability of dealers. There is no doubt that the dealer is the crucial link in the chain which forms this industry. Despite manufacturers' activities, it is the dealer who will determine if the present outlet will permit us to enter the large air conditioning and modified air conditioning market which is opening before us. Practically every major problem which faces this industry at the present time will fail or succeed, as the average dealer fails or succeeds in an understanding and an application of his business now and within the next 12 to 24 months.

"Third, the business magazines can make us 'industry minded.' We must remember that we must succeed in the face of growing competition. We have some initial advantages but we must utilize those advantages."

C. C. Snyder

In the afternoon, C. C. Snyder, of Republic Steel Corp., Massilon, Ohio, talked on "Stainless Steel." He said in part:

"It is not difficult to see the rapid developments being made with stainless steels. Evidences are on hand wherever our eyes rest—in the kitchen we see the stainless pots, pans and skillets—on the streets we have stainless markers, on buildings; we see doors and grillwork of polished metal or the dazzling brilliance of polished, high-lustre rustless sheets covering the towers, roofs and ornamental parts of our modern skyscrapers. Someone has stated 'there are as many brands of stainless on the market as there are 5-cent cigars.' This, perhaps, is somewhat exaggerated and might be reworded to say, 'as many brands as there are good 5-cent cigars.'

"The various types of stainless alloys can be divided into divisions as follows:

"Type A—10-15 per cent chrome.
"Type B—15-30 per cent chrome.
"Type C—16-20 per cent chrome, 10 per cent nickel.

"Chromium-nickel combinations not listed above and containing silicon, copper, molybdenum and tungsten.

"The greater the percentage of chromium and nickel, of course, the greater resistance to weathering, staining and rusting.

"The use of bright metals in the building world is receiving considerable attention today and no doubt shall see more extensive use in the future. The Chrysler and Empire buildings in New York City, the new Richman Bros. building in Detroit are gleaming examples of this newest art as applied to architecture.

"Considerably more power will be required to form and draw than to draw the same part in steel.

"Considerably more clearance must be allowed in forming than for the same part in steel. Some shops feel that three times as much clearance is essential. Another shop allows 15-20 per cent of the gauge of the material for clearances, which amounts to about twice the usual clearance.

"For blanking and shearing a very close adjustment of the tools must be maintained. The usual practice is a maximum of .001-.0015 for light gauges and slightly more for heavier gauges. It is sometimes necessary that presses be run somewhat slower for Enduro, particularly so until the dies are worn in.

"Good lubricants are essential to successful draw work. There are many special stainless drawing compounds now on the market. Some of the water soluble lubricants are very successful and should be used when further annealing is necessary, as they are easily removed. One of the most effective lubricants is a mixture of Lithopone and linseed oil, using enough oil to make a paste of the desired consistency.

"It is quite essential that the lubricant be entirely removed before annealing, as it is possible that the surface of the metal will be attacked at the high temperature. An addition of powdered talc and flour of sulphur to the above will often increase its efficiency.

"In cases where subsequent operations will be performed on brakes or presses, it is quite essential that precautions be taken to eliminate the marks, scratches and dents. It has been found that it simplifies the problem greatly to eliminate marring the sheet at the start rather than to polish out the marks.

"In addition to the use of a proper lubricant the application of adhesive tape to the dies can be used where the work applied to the metal is not severe, such as in bends on brakes. It is not recommended for deep drawing. Thin paper between the polished metal and the die is working well in some cases. Wax paper, oiled paper and in some cases ordinary newspaper have been used with marked success in the elimination of die scratches. The paper is usually used as an adjunct to the lubricant.

In Class A, 10-15 per cent chrome, a hardenable alloy, you will find the welds to be hard and brittle. Annealing at 1450-1500 deg. F. will soften the welds; it is not always practical to do so.

"Class B, chrome 15-30 per cent, will have the large grained cast structure in and adjacent to the weld, causing extreme brittleness. Annealing, if practical, will somewhat soften the weld, but even so, the weld would be classed as brittle. It should be stated, however, that the brittleness exists only at room temperature or lower and up to 250-300 deg. F., at which point toughness is apparent in the weld and adjacent metal.

"Classes C and D, chrome-nickel, are quite ductile. For electric arc welding, rods of the same material having a special flux coating should be used. Polarity should be reversed, that is, the electrode should be positive and the work the negative. Gas welding should be done with a slightly reducing flame.

"Do not expect soldered joints to carry any loads. Soldering should only be used to make tight joints that have been riveted or lock seamed. When soldering the polished material it is necessary to dull the surface in order to get adhesion of the solder. The following solution will do this satisfactorily:

"Hydrochloric acid, 90 parts.
"Ferric chloride, 50 parts.
"Nitric acid, 3 parts.

"Allow this solution to act for ten minutes or longer. Be sure that after soldering all traces of the acid are removed completely by washing with bicarbonate of soda water to which washing soda has been added. If this precaution is not taken, staining will occur.

FURMET OFFICERS

President—George C. Joslin.
1st Vice-Pres.—R. C. Gustafson.
2nd Vice-Pres.—Robert Renick.
3rd Vice-Pres.—H. S. Giffin.
4th Vice-Pres.—Lee W. Gillespie.
Secretary—H. R. Jones.
Treasurer—John C. Henley.

Executive Board

A. C. Selvig, Chairman.
F. A. Wilkening
W. P. Meador.
F. H. Boone.
P. R. Jordan.

Membership Committee

C. C. McManama.
Frank Michaels.

Paul R. Jordan

One of the interesting sessions of the convention was a discussion of ventilation, led by Paul R. Jordan, Indianapolis. Mr. Jordan began by discussing kitchen ventilation and showed how either a continuously operating gravity ventilator or an intermittently operating wall fan may be used to create an area of low pressure in the kitchen, thereby keeping fumes, smoke and odors within the kitchen and exhausting it to the outside. Such ventilation also serves to ventilate most first floor rooms.

The discussion was accompanied by a blackboard demonstration, with numerous questions asked and answered. Going from kitchen to attic space ventilation, Mr. Jordan explained several satisfactory methods for ventilating the attic for summer cooling and again brought out a number of questions which he answered.

The Banquet

The concluding event was the banquet, which was well attended and thoroughly enjoyed. A ladies' orchestra furnished music during the dinner and dance music after. The busiest man at the banquet was Geo. Joslin, in charge of entertainment. He, with two cohorts, staged the tinkers chorus, a lively affair, and he also wrote the words for the banquet songs.

L. O. S. T.

The "Furmets" staged their annual get-together on Wednesday night. This year's initiation was probably the most elaborate and best initiation staged. The same program is scheduled for the Louisville convention.

Air Conditioning Dominates The Cleveland Convention

LAST week in Cleveland there was held in conjunction with the joint annual conventions of the American Society of Heating and Ventilating Engineers and the American Society of Refrigeration Engineers an exhibit which proved one of the most startling events of the last two years.

Two years ago when the first exhibit was held by this organization, the steam, hot water, and the allied equipment manufacturers dominated the exhibits. This year the show turned out to be almost wholly a warm air and air conditioning display. If any proof is needed of the great popularity attached by the public and the heating industry to air conditioning, the Cleveland show proves beyond doubt that air conditioning as we know it today and as the industry looks for it to be in the near future will probably be our next new big industry.

So far as the business sessions of the convention are concerned, this part of the convention falls outside the scope of our field. But, as many visitors and attending members of the society declared, the exhibit dominated the meeting.

From mere point of size and variety of equipment displayed, this exhibit takes rank with our annual automobile shows. Hundreds of feet of floor area were packed tight with booths showing the latest equipment for heating, cooling, and air conditioning. Dozens of new and improved products were shown in working condition along with products which have been on the market for some time, but which are taking on added significance in the progress of air conditioning.

It would be easily possible to publish pages of reading matter about the displays, but for our purpose, that of telling what was shown and what exhibitors said, the following tabulation of the exhibits must suffice.

L. J. MUELLER FURNACE COMPANY, MILWAUKEE, WISCONSIN

Products Displayed: Steel and cast iron gas furnaces, gas fired boilers, Mueller-Sturtevant "Climator" air conditioning unit in operation. In the coal fired section Mueller displayed a new and complete line of square casings for cast iron and steel, coal or oil furnaces in all sizes.

In Attendance: H. P. Mueller, President and General Manager; Edward A. Jones, Engineer; C. L. Hewitt, Jr., Baltimore Branch Manager, and Harry B. McKee, Sales Representative.

Remarks: The "Climator" air conditioning unit in operation created considerable attention among engineers, architects and dealers.

HART & COOLEY MANUFACTURING COMPANY, CHICAGO, ILLINOIS

Products Displayed: No. 1000 Volume Control Register, 3000 Series Forced Air Registers, Heat Controls and Grilles.

In Attendance: George F. Nightingale, Manager of Western Contract Sales; J. H. Van Alsburg, Manager of Specialty Sales.

Remarks: Much interest was centered around the new registers which eliminate the need of dampers and outlet diffusers on large or small heating and ventilating systems.

OWENS-ILLINOIS GLASS COMPANY, TOLEDO, OHIO

Products Displayed: Dustop Air Filters.

In Attendance: E. F. Chittenden, J. S. Irvine and F. L. Myers.

Remarks: The new glass filters in paper casings were the point of interest for visitors all during the exhibit.

HENRY FURNACE & FOUNDRY COMPANY, CLEVELAND, OHIO

Products Displayed: Moncrief Gas Furnace, Moncrief Coal, Cast and Steel Furnaces, and air conditioning equipment.

In Attendance: Homer Cunningham, Herbert F. Curtis, Andrew Growe, Salesmen, and H. S. Sharp, Vice-President.

Remarks: More interest shown in regard to air conditioning than to any other particular feature.

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY, MINNEAPOLIS, MINNESOTA

Products Displayed: Temperature Controls for coal, gas and oil. Also industrial, space heating, refrigeration and air conditioning controls.

In Attendance: C. B. Sweatt, Vice-President and General Sales Manager; G. O. Kingsland, A. H. Lockrae, R. L. Goetzenberger, C. D. Lyford, Assistant Sales Managers; F. A. Rodgers, L. B. Miller and E. K. Scoggin, Salesmen.

Remarks: Automatic controls proved a feature hundreds of visitors desired information on and help in using.

SURFACE COMBUSTION CORPORATION, TOLEDO, OHIO

Products Displayed: Heatmaster Furnace Line, Surface Combustion Unit Heaters, Janitrol Conversion Burners, Surface Combustion Garage Heaters.

In Attendance: E. A. Weaver, Assistant Sales Manager; R. A. Bell, Engineer; N. B. Buehrer, Sales Engineer.

Remarks: New small sized, gas fired furnace proved a feature of sustained interest.

THE FOX FURNACE COMPANY, ELYRIA, OHIO

Products Displayed: Gas Automatic Air conditioning unit and Sunbeam air conditioning unit.

In Attendance: C. A. Olsen, L. A. Selman, E. P. Hayes and R. F. Gray.

Remarks: The Fox square cased Sunbeam furnace equipped for forced air drew much comment.

LAKESIDE COMPANY, HERMANSVILLE, MICHIGAN

Products Displayed: Furblo Furnace Blowers, IXL Air Washers, V-M Air Filters and accessories.

In Attendance: Harry E. Gray, Ohio Representative; Bert Bernstrom, Chief Engineer, and R. A. Meiche, Chicago Representative.

Remarks: Experienced a lively interest on part of dealers, architects and heating engineers.

POCAHONTAS FUEL COMPANY, INC., MOTORSTOKOR CORP., NEW YORK CITY

Products Displayed: Motorstrokors.

In Attendance: Henry M. Brown, Jr.

Remarks: Enthusiastic interest. Many inquiries.

AMERICAN AIR FILTER COMPANY, AIRGARD VENTILATOR CORP., LOUISVILLE, KENTUCKY

Products Displayed: Air cleaning equipment, Airgard for home and office ventilation, a unit which removes smoke and soot from air and eliminates street noises.

In Attendance: J. R. McConnell, Sales Manager; H. Kelly, District Manager; F. C. Mason, Merchandising Manager; H. C. Murphy, Vice-President; F. K. Minor, District Manager.

Remarks: A complete line of filters for all purposes was shown and explained.

THE BRYANT HEATER & MANUFACTURING COMPANY, CLEVELAND, OHIO

Products Displayed: Bryant Dualator, Model No. 253 Bryant Boiler, Model No. 443 Bryant Boiler, and Griswold Circulator.

In Attendance: Lyle C. Harvey, Sales Manager; E. J. Opal, Sales Engineer, and Mr. Griswold.

Remarks: A special automatic control board proved of much interest to visitors.

FOREST CITY FOUNDRIES COMPANY, CLEVELAND, OHIO

Products Displayed: Niagara Auxiliary, 110 Air Conditioner, and gas furnaces.

In Attendance: W. L. Seelbach, John Grouse, A. S. Kuehnert, of Gas Equipment Division; O. J. Kuenhold, J. Balacs, Designer and Engineer.

Remarks: Unusual trade interest. Surprising sales from display.

YORK OIL BURNER COMPANY, INC., YORK, PENNSYLVANIA

Products Displayed: York Oil Burner and York Oil Burner and Boiler Unit.

In Attendance: E. I. Kraber, General Manager and Treasurer; C. C. Fairman and C. V. Henry, Special Representatives.

Remarks: Oil burner application to air conditioning proved the subject of countless questions.

MOTOR WHEEL CORPORATION, HEATER DIVISION, LANSING, MICHIGAN

Products Displayed: MW Weather Control, MW Steam Boiler, MW Water Heater, MW Domestic and Commercial Ranges.

In Attendance: C. C. Carlton, Secretary; C. L. Stebbins, Sales Manager; Mr. Molingue, Sales Promotion; Howard Spawn, Advertising Council; Mr. Barker, Engineer, and G. C. Weaver, Chicago Representative.

Remarks: The new MW boiler and weather control attracted continuous crowds and comment.

HEALTH AIR SYSTEMS, DIVISION OF ECONOMY BALER COMPANY, ANN ARBOR, MICHIGAN

Products Displayed: Special oil and gas furnaces, Air Conditioning Units for domestic installation, Blowers and Economizers.

In Attendance: W. L. McDonald, Sales Manager, and R. L. Kolorik, Cleveland Branch Manager.

Remarks: A very fine show with much interest displayed on the part of dealers. Not only local, but attended by dealers from coast to coast in U. S. and Canada.

FEDDERS MANUFACTURING COMPANY, INC., BUFFALO, NEW YORK

Products Displayed: Unit Heaters and Electric Refrigeration Devices.

In Attendance: H. L. Heitzman.

Remarks: The refrigeration unit created much questioning and comment.

PEERLESS ELECTRIC COMPANY, WARREN, OHIO

Products Displayed: Forced air blowers and fans, exhaust fans, forced draft blowers, wall ventilators, and power motors.

In Attendance: W. S. Kingsbury, Research Engineer, and F. O. Mills, Manager of Specialty Sales.

Remarks: Fans for exhaust systems and forced air heating were continually causing questions.

PENN HEAT CONTROL COMPANY, PHILADELPHIA, PENNSYLVANIA

Products Displayed: General Electric heat regulators, damper controls, oil burner controls, motor valves, thermostats and electric time switches.

In Attendance: J. M. Reiley, President; R. M. Peters, Sales Manager; R. A. Demmer, E. J. Bohnen, F. C. Atwater, V. E. Malmfeldt, and The McLeod Company, Cleveland Distributors.

Remarks: Controls seemed to be uppermost in the minds of visitors.

EMERSON ELECTRIC MANUFACTURING COMPANY, ST. LOUIS, MISSOURI

Products Displayed: Motors, Furnace Blowers and Fans.

In Attendance: W. R. Fraser, Manager Motor Sales; Robert Mester, Specialty Department; T. J. Egan, Manager Chicago Office.

Remarks: Furnace blowers and fans proved the greatest attraction to visitors.

E. VERNON HILL COMPANY, CHICAGO, ILLINOIS

Products Displayed: Psychrometers, Gauges, and Air Testing Instruments.

In Attendance: E. V. Hill, President; P. J. Marschalk, Secretary, and E. B. Stark, Vice-President.

Remarks: Much interest shown in testing instruments by both engineers and contractors.

THE AUER REGISTER COMPANY, CLEVELAND, OHIO

Products Displayed: Registers, gravity, Air Conditioning Registers, and Grilles of different designs and finishes, Auer-De-Luxe Baseboard Register with chromatic plating, and Air Conditioning Registers for wall and base types.

In Attendance: George G. Auer, Vice-President, and Frank Joneshep, Manager.

Remarks: New line of De-Luxe registers attracted much comment.

UNI-FLO GRILLE CORPORATION, AFFILIATED WITH ALLIED PRODUCTS CORP., DETROIT, MICHIGAN

Products Displayed: Uni-Flo grilles and registers, featuring new models air deflecting type. Grille fins are placed at 20 degree angle to deflect air current and displace the conventional multi-louvre.

In Attendance: John A. Germonprez, Vice-President; J. D. Searles, Sales Manager; B. D. Wood, Sales Engineer.

Remarks: All models of Uni-Flo grilles and registers are the fin and bar type. They offer only 5 per cent resistance to air flow and have approximately 90 per cent free air opening. They conceal the chamber and diffuse the air.

THE COLUMBUS HUMIDIFIER COMPANY, COLUMBUS, OHIO

Products Displayed: Columbus Humidifiers, Models "A," "B" and "C."

In Attendance: Fred D. Pfening, President; Paul Pfening, and M. S. Conklin.

Remarks: New model "C" shown for first time. This is a completely automatic humidifier for warm air furnaces, to retail at a price of $15.

INDEPENDENT REGISTER AND MANUFACTURING COMPANY, CLEVELAND, OHIO

Products Displayed: Registers and Grilles, "Fabrikated" cold air faces and "Fabrikated" forced air registers.

In Attendance: E. C. Fox, Proprietor; Blair A. Quick, Sales Manager; B. W. Richardson, Assistant.

Remarks: New line of forced air registers and grilles brought much comment and questioning from both engineers and contractors.

DAIL STEEL PRODUCTS COMPANY, LANSING, MICHIGAN

Products Displayed: Air Conditioning Unit, Air Conditioning Heating Plant for gas or oil.

In Attendance: C. I. Murdock, Mr. Stuart and Mr. Harrison.

Remarks: Air conditioning units, especially stripped model, drew crowds all during the exhibit.

RICHARDSON & BOYNTON COMPANY, NEW YORK CITY

Products Displayed: Perfect and Superior furnaces, clothes dryer built in conjunction with heating equipment, boilers and radiators.

In Attendance: H. T. Richardson, Vice-President; L. McCulloch, Manager Buffalo Branch; A. B. Ford, Advertising and Sales Promotion, and G. E. Robinson.

Remarks: All units were the center of interested crowds all during the exhibit.

TUTTLE AND BAILEY MANUFACTURING COMPANY, NEW YORK CITY

Products Displayed: Ventilating registers, grilles and air conditioning registers.

In Attendance: Trow B. Warner, Sales Manager, and Eric Mollander.

Remarks: Proper registers and grilles for forced air work seemed to be uppermost in the minds of visitors.

THE AMERICAN TEMPERATURE INDICATING COMPANY, TOLEDO, OHIO

Products Displayed: Caliscope, temperature indicator, automatic caliscope, and combination indication and regulation.

In Attendance: Fred D. Merry, President; C. H. Kuhlman, Vice-President, and A. H. Betwel, Sales Manager.

Remarks: Temperature indicators proved a point of interest to all visitors.

INDEPENDENT AIR FILTER COMPANY, CHICAGO, ILLINOIS

Products Displayed: "Double Duty" self cleaning filter, "Kompak" fabric type filter, "Zig-Zag" unit filter, and "Kompak" dust arrester.

In Attendance: J. L. Harpham, President, and I. M. Cohen, Chief Engineer.

Remarks: The best show of its kind yet, proving the vitality of the industry. Many valuable contacts made.

THE YOUNG VENTILATING COMPANY, CLEVELAND, OHIO

Products Displayed: "Young" regulators.

In Attendance: E. O. Young, President.

Remarks: Secured very good results from our exhibit.

H. M. SHEER COMPANY, QUINCY, ILLINOIS

Products Displayed: Thermostats, regulators, gas valves, relays, and humidifiers.

In Attendance: R. T. Williams, Vice-President; L. M. Persons, Chief Engineer; J. Kaercher, Salesman, and O. Kuenhold, Salesman.

Remarks: Controls seemed to be a point of much interest to all visitors.

Because of the three big conventions reported in this issue, a number of the special departments have been omitted. We have also had to omit several articles of especial interest to sheet metal contractors which were planned for this issue. These departments will appear in the February 15 issue

NO EXTRAS TO BUY

The Hess Automatic Furnace comes complete with automatic humidifier, automatic heat regulator and electric blower. Its price is but little more than that of an ordinary furnace of the same capacity.

This attractive combination includes a heater with trouble-proof, 1-piece welded steel inner body—cannot leak dirt, gas or smoke. Made in two sizes for most of your jobs.

Hess Airwater Unit

Now, when new or repair work is scarce, sell the Hess Airwater Unit to modernize existing furnace jobs. It is furnished completely assembled. Can be quickly attached to any furnace. Washes, purifies, humidifies and forces the air circulation; keeps the home comfortable all year long; adds value to the property.

Make 1932 your best year. You can do it with Hess prices and equipment—"Makers of Furnaces for Over 50 Years." Mail the coupon NOW.

HESS WARMING & VENTILATING CO.
1201-1209 S. Western Ave.
Chicago, Ill.

Send me literature and dealer's prices at once.

Name.....

Address.....

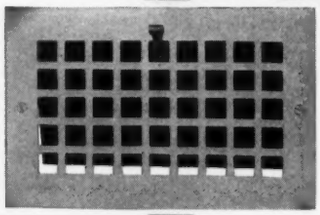
I am a Furnace Dealer ☐ Sheet Metal Contractor ☐

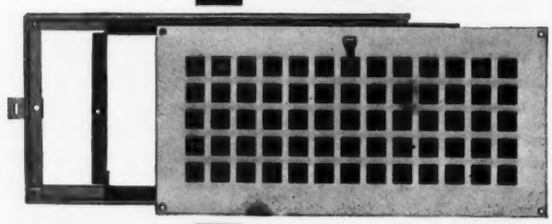
fortify *Your Position* with the H&C Line

Every proposal in 1932 will have to contain an edge on the other fellow to land the job. Consequently you can't afford to overlook the importance of fine registers. Standardize on the H & C line. In the air-conditioning field you will have the advantage of the only complete line of registers built specifically for air-conditioning—providing exceptionally neat, attractive installations free from leaks, rattles, and whistles. In the gravity field, more beautiful designs, greater air capacity and obviously superior workmanship. It's the most complete line of fine registers anywhere. See your jobber at once.

No. 3350—1-Piece Air-Conditioning Sidewall Register

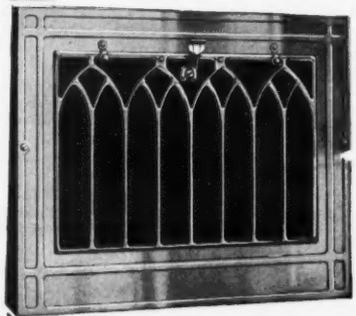
Face overlaps the wall opening. Though primarily designed for old house installations, this register is also entirely suitable for new work when removable face and flush installation are not essential. One-piece Baseboard Registers and Return Air Intakes to match.





No. 3351—3-Piece Air-Conditioning Sidewall Register

Sets FLUSH with the plaster and when furnished in prime coat may be decorated same as walls, providing a very pleasing effect. The 3-piece construction has many installation advantages for new house work.
3-Piece Baseboard Registers and Return Air Intakes to match.



No. 110—Baseboard Register (Gravity Type)

The artistic simplicity of its attractive design wins the enthusiastic approval of home owners every time. Its generous free air capacity is obvious.
One unit of a line that provides an ideal register for every purpose.

WROUGHT STEEL H&C WARM AIR REGISTERS

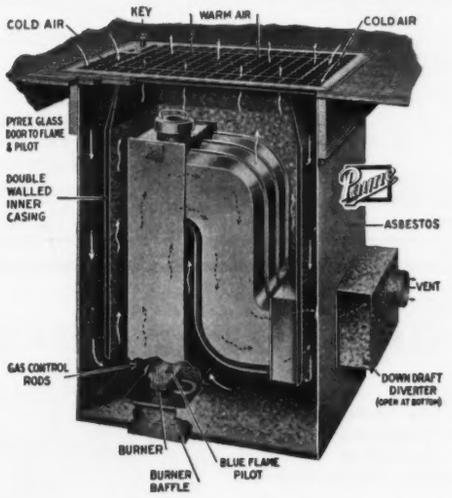
HART & COOLEY MFG. CO.

CHICAGO, 61 W. Kinzie St. PHILADELPHIA, 1600 Arch St.
New Britain, Conn., Corbin Ave. New York, 101 Park Ave.
Boston, 75 Portland St. Wm. Highton & Sons Div., Nashua, N. H.

Factories at Holland, Mich.—New Britain, Conn.—Nashua, N. H.

Registers for all purposes. Also a complete line of perforated and cast ornamental grilles, furnace regulators, dampers, pulleys, chain, and the H & C Automatic Heat Control.

PAYNE
Floor Furnaces



Winter's Substitute for Summer's HEAT!

THE PAYNE FLOOR Furnace uses gas—the cleanest, most dependable and most efficient of all fuels. Gives ideal summer heat indoors. Endorsed by thousands of users everywhere!

NO MORE COLD FLOORS

No Sweating of Windows

THE PAYNE Floor Furnace circulates fresh pure warm air in every nook and corner, keeps floors warm! Free from smoke, fumes and vapors!

WARM AIR HEATING Without a BASEMENT

PAYNE FLOOR FURNACES have been tested and proved in the crucible of time. Durably constructed. Easy to install and operate. Completely welded heating element. Heating efficiency, burner operation, safety, construction and performance have been approved by the American Gas Association—and by thousands of happy and enthusiastic users.

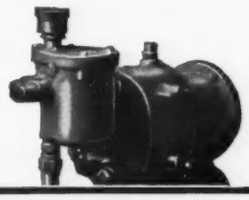
Every PAYNE FLOOR FURNACE installation is a friend-maker and a sure "repeater". No forced selling to put this item over. A sales success for sixteen years.

Write Today for Details of Dealer Franchise!

Payne

PAYNE FURNACE & SUPPLY CO.
Beverly Hills • California

There is a Payne Heat System for Every Building and Climate!



The HART *new 1932* plan means longer margins--*more money*

Here's an oil burner you can sell, and sell at a profit. Pioneer in the oil burner field, HART again proves its leadership with a plan for 1932 that conquers present day competition. Investigate—mail coupon today for details of plan and—

Sensationally Low Prices for 1932

Vacuum feed, exclusive on the HART, prevents flooding, eliminates intricate mechanism—offers the greatest single selling point in oil burners today.

Absolutely quiet—No noise, when it starts, while it burns, or when it shuts off. No belt or gears—fan and pump mounted on oversize motor shaft. Absolute comfort and freedom.

Magnetic self-cleaning Electrodes—Prevents dirty firing points, insures positive, unfailing ignition, eliminates service.

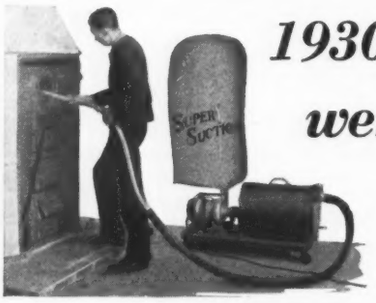
Low pressure atomization makes possible the use of just one size nozzle for entire range. An extra large nozzle orifice positively prevents clogging—there's no wear - out to it.

HART Oil Burner Corporation
Dept. 322
Peoria, Illinois

THIS COUPON BRINGS NEW PLAN

Name.....
Address.....
Town.....
State.....

322



1930 and '31 were good years

for owners of Super Suction Cleaners, because these owners could and did contact ten new prospects to one old customer. At no expense to these owners.

The 1932 model, now out, gives you over 60% *more* suction, so it cleans even faster than before and reduces your costs, increases your profits. When cleaning registers and radiators, take only the light and clean motor to the upper rooms, and there you use the extra bag we give you; keep it clean for upstairs. A new safety trap catches heavy objects if drawn in, and protects the fan.

Sixty percent more suction—a speedy, one-man outfit—safety trap—the motor alone goes upstairs—the large container empties soot like a coal scuttle—

Would you like to see the Plan Book which these owners used? It is free, and shows how they did it. Do you know how you can first try this good Super Suction before you decide to keep it? And then let it pay for itself? Easy. Send this clipping with your name and address on it, to

The National Super Service Company
1944 North 13th Street Toledo, Ohio

APEX Class BB Self-Contained, All-Bronze, Reducing Valve or Pressure Regulator, with Large-Capacity Strainer and Drip Pocket.

FOR HUMIDIFIERS

APEX Water Pressure Regulators or Reducing Valves with Built-in Strainers and Drip Pockets

Will Insure

MINIMUM WATER CONSUMPTION
NOISELESS OPERATION
STEADY WATER FLOW
PROPER HUMIDITY CONTROL
MINIMUM WEAR ON NOZZLE OR ORIFICE

Apex Regulator Company
Division of Fisher Governor Company
Marshalltown, Ia.

The Viking Shear

Compound lever handle—removable blades. Upper blade away from mechanic enabling easy following of work—an exclusive Viking feature.

Sold Under a Guarantee—Send for Particulars

VIKING SHEAR CO., Erie, Pa.

If you want to increase your Sheet Metal Business

Give Your Architect a Copy of

Standard Practice

in SHEET METAL WORK

Published by the National Association of Sheet Metal Contractors

SEND THE COUPON FOR FULL DETAILS

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Tell me all about the big Association Book Standard Practice in Sheet Metal Work.

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File This Copy

When you have finished reading this issue of AMERICAN ARTISAN, pass it on to others in your organization, marking the articles in which they should be particularly interested.

Then file it for future reference. You never know when you will encounter a problem in your business that is covered in this very issue.

PERFORATED METALS

All Sizes and Shapes of Holes
In Steel, Zinc, Brass, Copper, Tinplate, etc.
For All Screening, Ventilating and Draining
EVERYTHING IN PERFORATING METAL

THE HARRINGTON & KING PERFORATING CO.
5649 FILLMORE ST.-CHICAGO, ILL., U. S. A.
NEW YORK OFFICE, 114 LIBERTY ST.

Say you saw it in AMERICAN ARTISAN—Thank you!

PURE AIR Furnace is stronger--it's *double welded*

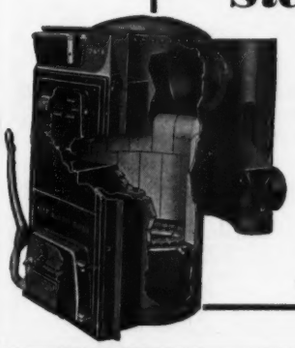
The Enterprise Pure-Air Furnace builds good will and is unexcelled as a profit maker. Joints are stronger—because **double welded**— a feature that makes a hit with prospects. Guaranteed for ten years against leaks.

2 New Features —Humidifier is on top where it belongs; an improved front designed by an artist. Both these features appeal to the better prospects.

Write for FREE booklet, "Welding and Riveting," explaining our superior welding process. Also write for attractive dealer proposition.

ENTERPRISE BOILER & TANK WORKS
1955 North Long Ave. - - - Chicago

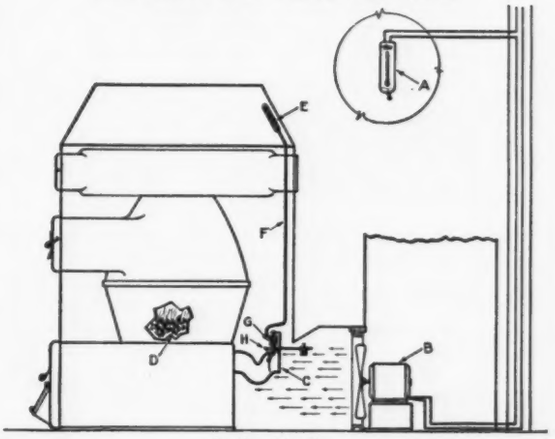
Real Quality in Steel Furnaces



You can look for unexcelled value in these Moncrief Steel Furnaces. Equipped with duplex roller bearing grates and solid cast iron front. Investigate the complete Moncrief line.

THE HENRY FURNACE & FOUNDRY CO.
3471 East 49th Street
Cleveland, Ohio
WRITE FOR PARTICULARS

Controlled Forced Draft Is Here At Last



In Combination

YOUR DRAFT TROUBLES ARE ALL OVER
The problem of poor chimney or cheap coal is instantly solved by

The Miles Controlled Forced Draft

Just attach the inlet box to your ashpit—connect the graduated control element to the bonnet—and the FURNACE FAN will do the rest.

Never before has there been CONTROLLED forced draft

Write for further detail.

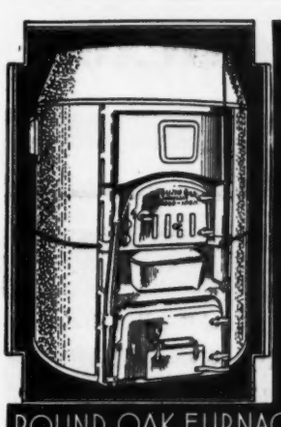
THE WARM AIR FURNACE FAN COMPANY
6545 CARNEGIE AVENUE CLEVELAND, OHIO

REGISTERS OF THE HOUR

AUER Quality Merchandise Is Your Satisfaction

There is an AUER Register and Grille for every need—the *Colonial, Aueristocrat, Economy, and Pro-Tex-Wall*—but the catalog will tell you better. Write for it today.

AUER REGISTER COMPANY
3608 Payne Avenue CLEVELAND, OHIO



ROUND OAK FURNACES

THE STANDARD of Comparison are PROFIT MAKERS for Dealers

WRITE FOR DETAILS

ROUND OAK FURNACE CO. DOWAGIAC MICH.

MARSHALLTOWN THE MARSHALLTOWN LINE **SHEARS**

No. 18

SHEARS THAT CUT

That's what you're looking for—shears that will save money for you—shears that stand the gaff.

Install at least one type of Marshalltown throatless shears in your shop. Do it now!

SHEARS FOR EVERY JOB: CUTTING CAPACITY UP TO ½".

The MARSHALLTOWN line is complete—a shear for every use.

THE CATALOGUE TELLS THE STORY—WRITE FOR IT

SPECIFICATIONS

CAPACITY—
18 gauge and lighter — 1¾" radius.

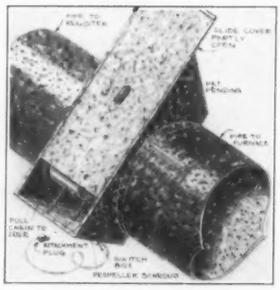
CUTTERS—
2"x1½"—high grade tool steel. Slightly knurled to feed material.

ADJUSTMENT—
One bolt. Instructions furnished.

SIZE AND MATERIAL—
Height 19½"; head cast iron; base cast iron; gears steel and cast iron. Shipping weight 45 lbs.

MARSHALLTOWN MFG. CO. MARSHALLTOWN IOWA

Mention AMERICAN ARTISAN in your reply—Thank you!



A "FORCT AIR" Furnace Booster

For direct installation in any cold air duct. Will not interfere with gravity circulation. Slide cover on side provides for summer cooling.

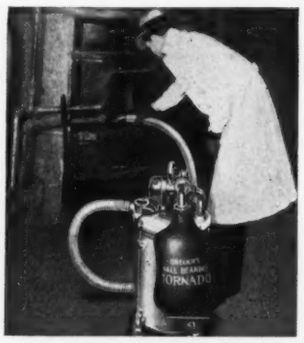
Quiet in operation. Unit complete, ready to plug in.

LIST, $25.00

"Forct Air" Heat Booster for Installation in Single Warm Air Pipe, List $15.00.

FORCT-AIR CO. 130 SOUTH SECOND ST. ROCKFORD, ILLINOIS

Keep Your Shop Busy All Winter With the Tornado Furnace Cleaner



The Tornado Furnace Cleaner gets you into the basement where it is easy to sell furnace repairs. And you make a profit on the cleaning job too!

One dealer sold 150 repair jobs as a result of furnace cleaning.

Tornado is most powerful cleaner built, low in price.

Write for sales plan that tells you how to get the business

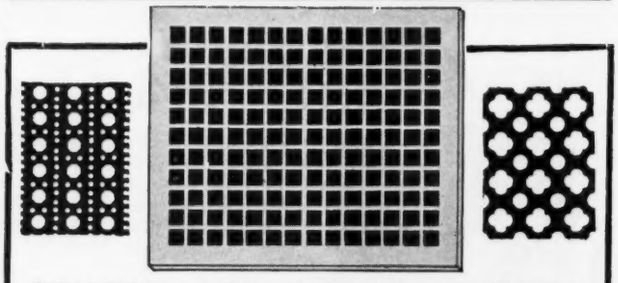
Only $149.50 Easy Terms and Free Trial

Breuer Electric Mfg. Co.
865 Blackhawk St., Chicago

The "Torrid" Furnace is designed to give a tremendous amount of heat, much more than that furnished by the ordinary tinner's furnace.

A fuel saver and generating machine of the finest quality made at the price.

GEO. W. DIENER MFG. CO.
404 North Monticello Ave. Chicago



PERFORATED METAL GRILLES

OF EVERY TYPE

SQUARE PERFORATIONS—IMITATION CANE and OTHER DESIGNS

For Ventilating Outlets, Warm or Cold Air Vents, Radiator Covers, etc.
Made to your specifications—in Steel, Brass, Bronze, etc.
All shapes—sizes and gauges—with screw holes if desired.

Send Us Your Specifications—Prompt Shipment
Attractive Prices

CHICAGO PERFORATING COMPANY
2444 West 24th Place Chicago, Illinois

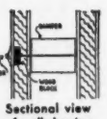
ALL ON ONE ORDER TO BRAUER

REPAIRS FOR FURNACES AND STOVES
OIL · COAL · GAS
A.G. BRAUER SUPPLY CO.
SAINT LOUIS

ALL IN ONE SHIPMENT TO YOU

YOUNG REGULATOR

A Locking and Indicating Device for Air Conditioning and Ventilating Systems



Sectional view of wall showing damper

Controls the volume of air flow through duct—the simplest and most effective method of controlling and showing position of volume damper. Positively tamperproof. Made of rust-resisting metals. Exclusive patented features. Write for catalog.

THE YOUNG VENTILATING CO.
2703 Woodland Avenue · Cleveland, Ohio

HERE IT IS—

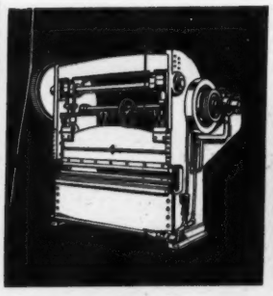
The New
WHITNEY PUNCH No. 4 B

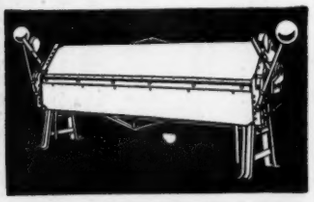
The only punch on the market offering all of these advantages.
Drop Forged—Parts Heat Treated—Punches and Dies Interchangeable with Our No. 4 Punch

Power—¼ Inch through 16 Gauge.
Deep Throat—2 Inches.
Balance—Natural Grip Handles Give Perfect Balance.
Weight 3 pounds.
Length—8½ Inches.

W. A. WHITNEY MFG. COMPANY
636 RACE STREET, ROCKFORD, ILL.

CHICAGO





Press Brake **Hand Bending Brake**

STEEL BRAKES—PRESSES—SHEARS

DREIS & KRUMP MFG. CO.
7404 LOOMIS BLVD. CHICAGO

Say you saw it in AMERICAN ARTISAN—Thank you!

Blower

Air Conditioning

• The Health Air Blower A Complete Air Conditioner •

for New or Old Home Installations

Low Priced *Write for our Attractive Proposition* **Efficient**

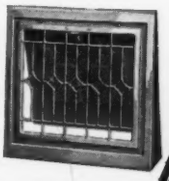
HEALTH AIR SYSTEMS, 1105 N. Main St., Ann Arbor, Mich.

Air Conditioner

REGISTERS

VENTILATORS . . GRILLES

"Fabrikated" Cold Air Faces and Floor Registers



ANY SIZE . . . ANY FINISH

Send for Catalog.

INDEPENDENT

INDEPENDENT REGISTER & MFG. CO.

3741 East 93rd Street • • • Cleveland, Ohio

Ask Us to Show You Why

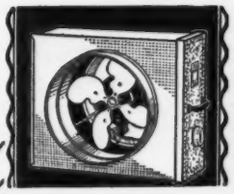
'LECTROMELT Processed FURNACES Are Better

We will send you Folder No. 10E. It tells you why

BRILLION FURNACE COMPANY

Brillion, Wis.

Let This Unit Boost Your Sales and Profits



A-C *Thermostatically Controlled* *Automatic* **HEAT BOOSTER**

Write Today for Full Information and Name of Nearest Jobber

A-C MANUFACTURING CO.

417 SHERMAN AVENUE PONTIAC, ILLINOIS

HANDY PIPE

PRICES

are the lowest we've ever quoted—but the quality stays the same. Write for *newest* discount sheet.

F. Meyer & Bro. Co.

Peoria, Ill.

LEARN MORE ABOUT THIS HUMIDIFIER

COLUMBUS

Automatic Air Conditioner for the Home

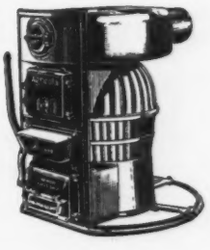
HUMIDIFIER

COLUMBUS HUMIDIFIER COMPANY

Station A, Columbus, Ohio

Order Only Genuine Agricola

REPAIR PARTS

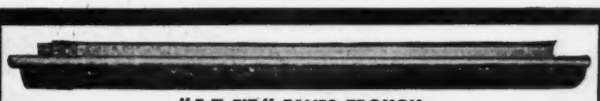


Only genuine AGRICOLA Repair Parts assure perfect fitting castings. Prompt shipments.

AGRICOLA FURNACE CO., Inc.

Gadsden, Alabama

Offices in principal cities



"E-Z FIT" EAVES TROUGH

Bead is cut back, making it easy to put gutter together. Requires no soldering—not affected by expansion or contraction.

Write for Catalogue. Order from your Jobber.

"BB" The mark of quality

Eaves Trough . Gutter Hangers . Conductor Pipe
Conductor Fasteners . Mitres . End Pieces and Caps
Conductor Heads . Ornamental Straps . Ventilators, etc.

BERGER BROTHERS CO.

229-237 Arch Street, Philadelphia, Pa.

BUYERS' DIRECTORY

Air Cleaners

American Air Filter Co., Inc., Louisville, Ky.
American Fdy. & Furnace Co., Bloomington, Ill.
General Air Conditioning Co., Inc., Chicago, Ill.
Kleenaire Filter Co., Stevens Point, Wis.
Lakeside Co., Hermansville, Mich.
Meyer & Bro., F., Peoria, Ill.

Air Washers

A. Gehri & Co., Tacoma, Wash.
Health Air Systems, Ann Arbor, Mich.
Hess Warming & Vent. Co., Chicago, Ill.
Menominee Air Washer Co., Menominee, Mich.

Asbestos—Liquid

Technical Products Co., Pittsburgh, Pa.

Asbestos Covering and Paper

Stnadard Asbestos Co. of Chicago, Chicago, Ill.
Wilson, Grant, Inc., Chicago, Ill.

Ash Sifter

Diener Mfg. Co., G. W., Chicago, Ill.

Blast Gates

Berger Bros. Co., Philadelphia, Pa.

Blowers

American Fdry. & Furnace Co., Bloomington, Ill.
Forct-Air Co., Rockford, Ill.
A. Gehri & Co., Tacoma, Wash.
General Air Conditioning Co., Inc., Chicago, Ill.
Health-Air Systems, Ann Arbor, Mich.
Hess Warming & Vent. Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Menominee Air Washer Co., Menominee, Mich.

Blowers—Draft

Warm Air Furnace Fan Co., Cleveland, Ohio

Brakes—Bending

Dreis & Krump Mfg. Co., Chicago, Ill.
Interstate Machinery Co., Chicago, Ill.

Brakes—Cornice

Dreis & Krump Mfg. Co., Chicago, Ill.

Brass and Copper

American Brass Co., Waterbury, Conn.
Revere Copper and Brass Inc., Rome, N. Y.

Burners—Oil

Hart Oil Burner Corp., Peoria, Ill.

Cans—Garbage

Diener Mfg. Co., G. W., Chicago, Ill.

Castings—Malleable

Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal

Globe Iron Roofing and Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Cement—Furnace

Lastik Products Corp., Pittsburgh, Pa.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Technical Products Co., Pittsburgh, Pa.

Cement—Roofing

Lastik Products Corp., Pittsburgh, Pa.

Chain—Furnace

Hart & Cooley Mfg. Co., Chicago, Ill.

Chaplets

Fanner Mfg. Co., Cleveland, Ohio

Cleaners—Furnace Vacuum

Breuer Elec. Mfg. Co., Chicago, Ill.
Brillion Furnace Co., Brillion, Wis.
Densmore & Quinlan Co., Kenosha, Wis.
Grand Rapids Furnace Cleaner Co., Grand Rapids, Mich.
National Super Service Co., Toledo, Ohio

Conductor Elbows and Shoes

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Globe Iron Roofing & Corrugatnig Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Conductor Fittings

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Braden Mfg. Co., Terre Haute, Ind.
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
David Levow, New York, N. Y.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Rival Strap Corp., New York, N. Y.

Conductor Pipe

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Copper

American Brass Co., Waterbury, Conn.
Revere Copper & Brass Inc., Rome, N. Y.

Cornices

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Crimping Machines

Bertsch & Co., Cambridge City, Ind.

Cut-offs—Rain Water

Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Dampers—Quadrants—Accessories

Aeolus Dickinson, Chicago, Ill.
Hart & Cooley Mfg. Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Parker-Kalon Corp., New York, N. Y.
Young Ventilating Co., Cleveland, Ohio

Dampproofings

Lastik Products Corp., Pittsburgh, Pa.

Diffusers—Air Duct

Aeolus Dickinson, Chicago, Ill.

Drive Screws—Hardened Metallic

Parker-Kalon Corp., New York

Eaves Trough

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Eaves Trough Hangers

Berger Bros. Co., Philadelphia, Pa.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Fans—Furnace

A-C Mfg. Co., Pontiac, Ill.
American Fdy. & Furnace Co., Bloomington, Ill.
A. Gehri & Co., Tacoma, Wash.
Warm Air Furnace Co., Cleveland, Ohio

Filters—Furnace

American Air Filter Co., Inc., Louisville, Ky.
A. Gehri & Co., Tacoma, Wash.
Kleenaire Filter Co., Stevens Point, Wis.

Fluxes—Soldering

Kester Solder Co., Chicago, Ill.

Forming Rolls

Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

Furnaces for Gas or Oil

Dail Steel Products Co., Lansing, Mich.
Health-Air Systems, Ann Arbor, Mich.

Furnaces—Gas

American Fdy. and Furnace Co., Bloomington, Ill.
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Foundry Co., Cleveland, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Meyer Furnace Co., Peoria, Ill.
Payne Furnace and Supply Co., Beverly Hills, Calif.
Round Oak Furnace Co., Dowagiac, Mich.
Rudy Furnace Co., Dowagiac, Mich.
Wise Furnace Co., Akron, Ohio

Furnaces—Gas Auxiliary

Forest City Foundries Co., Cleveland, Ohio

Furnaces—Oil Burning

Motor Wheel Corp., Heater Div., Lansing, Mich.

Furnaces—Warm Air (See Also Unit Air Conditioners)

Agricola Furnace Co., Gadsden, Ala.
American Fdy. & Furnace Co., Bloomington, Ill.
Andes Range & Furnace Corp., Geneva, N. Y.
Brillion Furnace Co., Brillion, Wis.
Dail Steel Products Co., Lansing, Mich.
Deshler Foundry & Machine Works, Deshler, Ohio
Dowagiac Steel Furnace Co., Dowagiac, Mich.
Enterprise Boiler & Tank Works, Chicago, Ill.
Forest City Foundries Co., Cleveland, Ohio
Graff Furnace Co., Scranton, Pa.
Health-Air Systems, Ann Arbor, Mich.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess Warming & Vent. Co., Chicago, Ill.
Lennox Furnace Co., Marshalltown, Iowa
Liberty Foundry Co., St. Louis, Mo.
May Fiebeger Furnace Co., Newark, Ohio
Meyer Furnace Co., The, Peoria, Ill.
Midland Furnace Co., Columbus, Ohio
Motor Wheel Corp., Heater, Div., Lansing, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Calif.
Peerless Foundry Co., Indianapolis, Ind.
Round Oak Furnace Co., Dowagiac, Mich.
Rudy Furnace Co., Dowagiac, Mich.
Schwab Furnace & Mfg. Co., Cedar Grove, Wis.
Waterman-Waterbury Co., Minneapolis, Minn.

Furnaces—Warm Air (See Also Unit Air Conditioners)

Wise Furnace Co., Akron, Ohio

Gages—Draft

Ellison Draft Gage Co., Chicago, Ill.

Grilles

Auer Register Co., Cleveland, Ohio
Chicago Perforating Co., Chicago, Ill.
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Mfg. Co., Chicago, Ill.
Independent Register & Mfg. Co., Cleveland, Ohio

Guards—Machine and Belt

Chicago Perforating Co., Chicago, Ill.
Harrington & King Perforating Co., Chicago, Ill.

Handles—Boiler

Berger Bros. Co., Philadelphia, Pa.

Handles—Furnace Door

Fanner Mfg. Co., Cleveland, Ohio

Handles—Soldering Iron

Parker-Kalon Corp., New York, N. Y.

Heaters—Cabinet

Agricola Furnace Co., Gadsden, Ala.
Motor Wheel Corp., Heater Division, Lansing, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Calif.
Waterman-Waterbury Co., Minneapolis, Minn.

Heaters—School Room

Meyer Furnace Co., The Peoria, Ill.
Waterman-Waterbury Co., Minneapolis, Minn.

Humidifiers

Automatic Humidifier Co., Cedar Falls, Iowa
Clarm Mechanical Devices Co., Lima, Ohio
Columbus Humidifier Co., Columbus, Ohio
Diener Mfg. Co., G. W., Chicago, Ill.
Hess Warming & Vent. Co., Chicago, Ill.
Menominee Air Washer Co., Menominee, Mich.
Meyer & Bro. Co., F., Peoria, Ill.
Sallada Mfg. Co., Minneapolis, Minn.
J. L. Skuttle Mfg. Co., Dowagiac, Mich.

Humidifier Valves

Apex Regulator Co., Marshalltown, Ia.

Machinery—Culvert

Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

Machinery—Rebuilt

Interstate Machinery Co., Chicago, Ill.

Machines and Tools—Tinsmith's

Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Parker-Kalon Corp., New York, N. Y.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A. Rockford, Ill.

Metal Lath—Expanded

Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

(Continued on page 38)

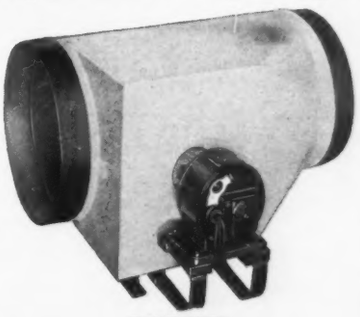
A Heat Hustler Fan Forces Air Through a Single Warm Air Pipe

Heats garages, sun porches and other rooms that will not heat by gravity. Mounts directly in the warm air pipe. Draws heat from the furnace and forces it into the hard-to-heat room. Quick heat for a bathroom.

Four reasons why you should use the American Heat Hustler:

1. It uses a positive pressure, rotary type fan.
2. Motor is outside the warm air flow, adding greatly to life of motor and leaving as much space for gravity air flow as before the Heat Hustler was installed.
3. It is quiet.
4. Furnished for either automatic or manual control.

Price list, with descriptive literature showing different models, sizes, etc., will be sent you by return mail upon receipt of your request. CLIP AND SEND THIS AD IN NOW!



PATENTED

AMERICAN FOUNDRY & FURNACE COMPANY

Bloomington, *World's largest manufacturers of blower furnace systems* **Illinois**

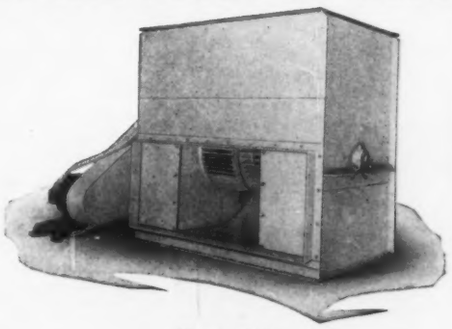
A FILTERED-AIRE BLOWER FORCES AIR TO ALL WARM AIR PIPES

Cleans the air and forces circulation.
Mounts at rear or at side of furnace.

Six reasons why you should use the Filtered-Aire Blower:

1. It is a multi-vane blower—the same type as used in big schools, churches, etc.
2. Ball bearings located outside air chamber.
3. By-pass damper automatically by-passes filters and blower for gravity circulation when fan is not running.
4. Four adjustable speeds—all quiet.
5. Rated by firepot diameter of furnace with which it is to be used. Technical ratings if desired.
6. Automatically controlled.

Price list, literature showing different models, sizes and full information for installing forced air jobs, wiring diagrams, etc., sent on request.



AMERICAN FOUNDRY & FURNACE CO.

BLOOMINGTON ILLINOIS Dept. AA

The Pioneer Weather King promotes Health, Comfort and Efficiency. It humidifies the air, so necessary for healthful surroundings, and it also saves on fuel costs.

The Pioneer

WEATHER KING

Health Builder and Profit Builder

Nowadays home owners want equipment that protects the health of their families. Cash in on this interest by selling the Pioneer Weather King—the Health and Profit Builder. It is trouble-free, easily installed and has 14 sales points all in your favor.

Write for literature

The Menominee Air Washer Co.
Menominee, Michigan

You Keep What You Make

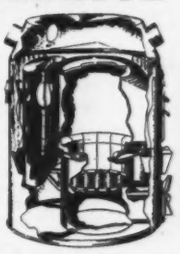
with the

X-L-ALL

Rugged Steel

WARM AIR FURNACE

(Pat. Applied For)



HERE'S a good furnace that brings you a good profit and you keep what you make because it is a good furnace. You don't have to put back your profits in a lot of service calls. Your customer is satisfied from the start. The X-L-ALL is economical to buy, economical to operate, and assures health, comfort and cleanliness. Its unusual features are so numerous that we could hardly do them justice in the description that would be possible here. So be sure and mail this coupon today. It won't be long before you'll be saying that this was your lucky day.

Deshler Foundry & Machine Works
140-142 S. East Ave., Deshler, Ohio

Please send me without obligation
.....The X-L-ALL Furnace Book.
.....The X-L-ALL Dealer Proposition.

Name.....
Street.....
City.....

Say you saw it in AMERICAN ARTISAN—Thank you!

BUYERS' DIRECTORY

(Continued from page 36)

Miters

Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co. Philadelphia, Pa.
Braden Mfg. Co., Terre Haute, Ind.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Nails—Hardened Masonry

Parker-Kalon Corp., New York, N. Y.

Paint—Roof

Lastik Products Co., Inc., Pittsburgh, Pa.

Perforated Metals

Chicago Perforating Co., Chicago
Harrington & King Perforating Co., Chicago, Ill.

Pipe and Fittings—Furnace

Henry Furnace & Fdy. Co., Cleveland, Ohio
Meyer & Bro., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Peerless Foundry Co., Indianapolis, Ind.

Pokers—Furnace

Fanner Mfg. Co., Cleveland, Ohio
Independent Reg. & Mfg. Co., Cleveland, Ohio

Pulleys—Furnace

Hart & Cooley Mfg. Co., Chicago, Ill.

Punches

Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Parker-Kalon Corp., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

Punches—Combination Bench and Hand

Niagara Mach. & Tool Wks., Buffalo, N. Y.
Parker-Kalon Corp., New York, N. Y.

Punches—Hand

Niagara Mach. & Tool Wks., Buffalo, N. Y.
Parker-Kalon Corp., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

Radiator Cabinets

Hart & Cooley Mfg. Co., Chicago, Ill.

Registers

Auer Register Co., Cleveland, Ohio
Forest City Foundries Co., Cleveland, Ohio
Hart & Cooley Mfg. Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Register & Mfg. Co., Cleveland, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Waterloo Register Co., Waterloo, Ia.;

Registers—Wood

Auer Register Co., Cleveland, O.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Regulators—Automatic Heat

Hart & Cooley Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Modern Heat Regulator Co., Cleveland, Ohio
White Mfg. Co., Minneapolis, Minn.

Repairs—Stove and Furnace

Brauer Supply Co., A. G., St. Louis, Mo.
Des Moines Stove Repair Co., Des Moines, Iowa
Northwestern Stove Repair Co., Chicago, Ill.
Peerless Fdry. Co., Indianapolis, Ind.

Ridging

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Rings—Furnace Casing

Forest City Foundries Co., Cleveland, Ohio

Roof Flashing

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Roofing—Iron and Steel

American Rolling Mill Co., Middletown, Ohio
Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Newport Rolling Mill Co., The, Newport, N. Y.
Republic Steel Corp., Youngstown, Ohio

Roofing—Tin and Terne

Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Republic Steel Corp., Youngstown, Ohio

Rubbish Burners

Hart & Cooley Mfg. Co., Chicago, Ill.

School—Sheet Metal Pattern Drafting

St. Louis Technical Institute, St. Louis, Mo.

Schools—Warm Air Heating

St. Louis Technical Institute, St. Louis, Mo.

Screws—Hardened Metallic Drive

Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Parker-Kalon Corp., 200 Varick St., New York

Screws—Hardened Self-Tapping, Sheet Metal

Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Parker-Kalon Corp., New York

Screens—Perforated Metal

Chicago Perforating Co., Chicago, Ill.
Harrington & King Perforating Co., Chicago, Ill.

Scuppers

Aeolus Dickinson, Chicago, Ill.

Shears—Hand and Power

Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Viking Shear Co., Erie, Pa.

Sheet Metal Screws—Hardened, Self-Tapping

Parker-Kalon Corp., New York

Sheets—Alloy

Inland Steel Co., Chicago, Ill.
International Nickel Co., New York, N. Y.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, Ohio

Sheets—Black, Corrugated, Galvanized

American Rolling Mill Co., Middletown, Ohio
Granite City Steel Co., Granite City, Ill.
Gulf States Steel Co., Birmingham, Ala.
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, O.

Sheets—Copper

American Brass Co., Waterbury, Conn.
Revere Copper & Brass Inc., Rome, N. Y.

Sheets—Copper Bearing Steel

American Rolling Mill Co., Middletown, Ohio
Granite City Steel Co., Granite City, Ill.
Gulf States Steel Co., Birmingham, Ala.
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, Ohio

Sheets—Copper (Lead Coated)

American Brass Co., Waterbury, Conn.
Revere Copper & Brass Inc., Rome, N. Y.

Sheets—Iron

American Rolling Mill Co., Middletown, Ohio
Granite City Steel Co., Granite City, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Newport Rolling Mill Co., Newport, Ky.
Republic Steel Corp., Youngstown, O.

Sheets—Monel Metal

International Nickel Co., New York

Sheets—Nickel

International Nickel Co., New York

Sheets—Pure Iron Copper Alloy

Newport Rolling Mill Co., Newport, Ky.

Sheets—Refined Open Hearth Iron

American Rolling Mill Co., Middletown, Ohio

Sheets—Special Finish

American Rolling Mill Co., Middletown, Ohio
Gulf States Steel Co., Birmingham, Ala.
Inland Steel Co., Chicago, Ill.
Newport Rolling Mill Co., Newport, Ky.
J. M. & L. A. Osborn Co., Cleveland, Ohio
Republic Steel Corp., Youngstown, Ohio

Shingles and Tile—Metal

Globe Iron Roofing & Corrugated Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Skylights

Globe Iron Roofing & Corrugating Co., Cincinnati, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Snow Guards

Berger Bros Co., Philadelphia, Pa.
David Levow, New York, N. Y.
Rival Strap Corp., New York, N. Y.

Solder

Kester Solder Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Solder—Acid Core

Kester Solder Co., Chicago, Ill.

Solder—Rosin Core

Kester Solder Co., Chicago, Ill.

Solder—Self-Fluxing

Kester Solder Co., Chicago, Ill.

Soldering Furnaces

Diener Mfg. Co., G. W., Chicago, Ill.

Soot Destroyer

Saginaw Salt Prod. Co., Saginaw, Mich.

Specialties—Hardware

Diener Mfg. Co., G. W., Chicago, Ill.

Stars—Hard Iron Cleaning

Fanner Mfg. Co., Cleveland, Ohio

Stove Pipe and Fittings

Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Stove and Furnace Trimmings

Fanner Mfg. Co., Cleveland, Ohio

Strainers—Roof

David Levow, New York, N. Y.
Rival Strap Corp., New York, N. Y.

Straps—Ornamental Pipe

David Levow, New York, N. Y.
Rival Strap Corp., New York, N. Y.

Tinplate

Granite City Steel Co., Granite City, Ill.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.
Republic Steel Corp., Youngstown, O.

Tools—Tinsmith's

(See Machines—Tinsmith's)

Torches

Diener Mfg. Co., G. W., Chicago, Ill.

Unit Air Conditioners

American Fdry. & Furnace Co., Bloomington, Ill.
Andes Range & Furnace Corp., Geneva, N. Y.
Dail Steel Products Co., Lansing, Mich.
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Fdry. Co., Cleveland, Ohio
Health-Air Systems, Ann Arbor, Mich.
Hess Warming & Ventilating Co., Chicago, Ill.
Lennox Furnace Co., Marshalltown, Iowa
May-Fiebeger Co., Newark, Ohio
Meyer Furnace Co., Peoria, Ill.
Midland Furnace Co., Columbus, Ohio
Motor Wheel Corp., Lansing, Mich.
Payne Furnace & Supply Co., Beverly Hills, Calif.
Rudy Furnace Co., Dowagiac, Mich.
Waterman-Waterbury Co., Minneapolis, Minn.

Vacuum Cleaners—Furnace

(See Cleaners—Furnace Vacuum)

Ventilators—Ceiling

Hart & Cooley Mfg. Co., Chicago, Ill.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Reg. & Mfg. Co., Cleveland, Ohio

Ventilators—Floor

Aeolus Dickinson, Chicago, Ill.

Ventilators—Roof

Aeolus Dickinson, Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Burt Mfg. Co., Akron, Ohio
Jordan & Co., Paul R., Indianapolis, Ind.
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

Water Pressure Regulators

Apex Regulator Co., Marshalltown, Ia.

Wood Faces—Warm Air

Auer Register Co., Cleveland, Ohio
Milcor Steel Co., Mil., Canton, Chgo., LaCrosse, K. C.

RIVAL STRAP CORP. 308 WEST 20th ST. NEW YORK, N. Y.

THE "RIVAL" and "FITRITE"
One-Piece Ornamental Leader Straps
Patented July 10, 1928; Jan. 6th, 1931

Made in SIX STYLES

Straps Sold Through Jobbers Only

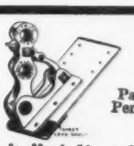
Write for folder showing complete line and sizes

"FITRITE"
Mop Heads & Staples
Malleable Iron

Write Dept. "A" for full details and prices

"FITRITE" SKYLIGHT GEARING

Iron or Bronze 3/8"-1/2" and 1" sizes.
Made also for chain operation



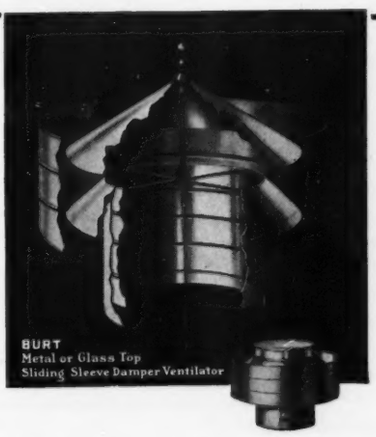
Patent Pending

"Fitrite" Adjustable PIPE SNOW GUARDS
Galvanized Iron or Bronze

"FITRITE" *Bronze* ROOF STRAINERS
3 Types. For Roofs having inside cast iron leader. Type "X" (illustrated), also made in Malleable Iron.

"FITRITE" *Bronze* BEEHIVE STRAINERS
For Round Leaders
3"-4"-5"-6"-7"-8" Diameter

DAVID LEVOW 308 WEST 20 ST. NEW YORK



NEW PRICES
ON METAL AND GLASS TOP VENTILATORS

Ask Burt to submit a proposal on your next ventilation job and see what you can save by using Burt Metal or Glass Tops. They maintain the high standard of Burt quality at new low prices.

The BURT MFG. Co.
Ventilators-Oil Filters-Exhaust Heads
930 S. High St. Akron, Ohio

NIAGARA
REVOLVING MACHINE BENCH

NEW SPACE SAVING

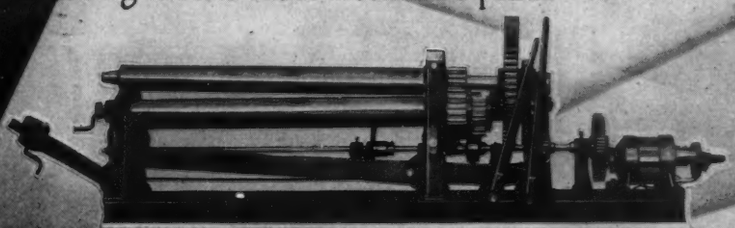
SAVE space with this new Revolving Machine Bench for sheet metal workers' machines. Turret top holds four hand-operated rotary machines such as crimpers, beaders, burring, turning, wiring machines, etc.

Regular bench standards supplied with machines are used, eliminating the need for special holders or standards. This allows any machine to be easily removed. Ample space provided between the machines for four operators working simultaneously, yet the bench occupies less than three square feet of floor space.

New, compact Niagara Revolving Machine Bench

NIAGARA MACHINE & TOOL WORKS
Manufacturers of Presses, Shears, Machines and Tools for Working Sheet Metal
637-697 NORTHLAND AVENUE BUFFALO, N. Y.
New York City 50 Church St. Philadelphia Elverson Bldg. Pittsburgh Park Bldg. Detroit General Motors Bldg.

PLATE BENDING ROLLS
Capacities-Lightest sheet to heaviest plate



Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work

BERTSCH & COMPANY
Cambridge City Indiana

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BUSINESS CHANCES

Lightning Rods—Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. L. K. Diddie Company, Marshfield, Wis.

For Sale—Furnace and sheet metal shop in a good town in the dairy district in northern Illinois. Address O-544, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

PHILIP V. W. PECK
PATENT AND TRADE MARK LAW
Barrister Building, Washington, D. C.
Y-544

For Sale—A bargain. One No. 30 slightly used Bryant warm air gas furnace complete with humidifier and eight day thermostat. Address Jacob Brenner Company, Inc., 47 Third Street, Fond du Lac, Wisconsin. H-545

For Sale—Sheet metal and oil burner shop in town of 10,000, or will sell tools separate including 8 foot brake. Old age and poor health reason for selling. Address C. E. Walters, 418 East Lincoln Highway, De Kalb, Illinois. M-545

Live Men Who Can

advance themselves for future opportunities with Technical Training should prepare now. We have the finest courses in heating, ventilating (all branches), sheet metal, contracting, estimating, etc. Specialized courses provided at low prices. Write us your desires. No obligation. Information is free.

ST. LOUIS TECHNICAL INSTITUTE
4543 Clayton Ave., Box 2, St. Louis, Mo.

For Sale—Well established furnace and sheet metal shop in St. Louis. A No. 1 tool, good truck, shop well stocked with material. Price, $800. Terms. Reason for selling, retiring. Address O-545, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

For Sale—a first class furnace and sheet metal shop in central Iowa. Well established. Tools, stock and equipment, $1500.00. Address R-545, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Wanted to buy for cash—Stock of furnaces and registers. Price must be right. Address Budd Clusserath, 586 Fayette Street, Hammond, Indiana. S-545

HELP WANTED

Wanted—Salesmen

We have a live proposition open for salesmen of ability who appreciate the real future of modern warm air heating and air conditioning. Our line represents individuality and efficiency and is complete in all details. Men must be of proven ability, have fine following with trade, and be in position to lay out and sell modern trunk line forced air work. Excellent territories open.

Dail Steel Products Company
Lansing, Mich.
D-545

HELP WANTED

Salesmen Wanted—Well known and established manufacturer of sheet metal products has good north central territories open for experienced salesmen, preferably those now calling on sheet metal shops in Illinois, Wisconsin, Michigan, Indiana and Iowa. For men now contacting this trade, this will be profitable side line. Liberal Commission. When writing give character and experience. Address L-545, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

SITUATION WANTED

Situation Wanted—As West Coast territory salesman for a reputable manufacturer. Can furnish best of references. For full particulars write F-544, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—Engineer or sales engineer, gravity and fan heating, air conditioning, member A. S. H. V. E., A. S. M. E., twenty years successful retail and wholesale experience. Address K-545, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—By technical school graduate. Wide experience in factory and general shop work. Address P-545, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—Heating engineer, well known in the industry, with experience in sales promotion and advertising, desires connection with firm interested in developing air conditioning equipment. Excellent training, broad experience, best of references, and a record that will stand investigation. Address B-545, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—By first class sheet metal worker. Can layout and estimate large or small work. Long experience in Government detail, indirect heat, fan systems, and ventilating. 40 years old. Will go anywhere. Address X-544, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—By a sheet metal and furnace man Can also do plumbing. Any reasonable offer will be accepted. Can come any time. Address W. H. Parker, 402 Pennsylvania Avenue, Abington, Illinois. Z-544

Situation Wanted—By first class sheet metal worker. Experienced in shop work, pattern drafting, skylight, ventilating, air conditioning, blow pipe and all outside work, both in the making and erecting. Best of references. Married, sober, and reliable. Would like good year round proposition if possible in Iowa or southern Minnesota. Address A-545, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

SITUATION WANTED

Situation Wanted—By an experienced hardware clerk and salesman. Would like to make a change with some good hardware firm by March 1st. Wisconsin preferred. Address R-544, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—By a first class plumber, steam fitter and sheet metal worker. Good worker. Can furnish best of references. West or North West preferred. Address J. J Herlick, Box 473, Harvey, North Dakota. S-544

Situation Wanted—By practical sheet metal and furnace man. Experienced in gravity and conditioned air. Have complete knowledge of layout, estimating and sales. Would like to make a connection with some reliable firm. Can locate anywhere. T-544, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

Situation Wanted—By all around Scandinavian tinner and furnace man Have had some business experience. Prefer Minnesota, Iowa, or Nebraska. Address C-545, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—A good tinner, plumber, fitter and repair man wants to run shop on commission or commission and small wages, with privilege to rent or buy later. Please state particulars. Am middle aged and married. West of Mississippi river preferred. Address F-545, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

Situation Wanted—Have had 28 years experience as tinner and plumber. Am qualified to do work in the following lines: auto radiator repairing, erecting steel ceilings, pump and windmill repairing, steam and hot water work, installing radios, and any kind of mechanical job that comes in a shop. Can give good references. Address G-545, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Ill.

Situation Wanted—Good sheet metal man and plumber now open for good job. A-1 references. Married. Will go any place. Address M-544, AMERICAN ARTISAN, 139 North Clark Street, Chicago, Illinois.

TOOLS AND MACHINERY

For Sale—Complete set of tinners' tools, including one 8 foot Robinson brake. A complete list will be furnished on request. Address W. H. Werbe, 204 South Union Street, Kokomo, Indiana. P-544

Must Sell—Good used suction furnace cleaner mounted on trailer, complete with 38 inch fan, Dodge motor, 50 feet suction tubing, and 600 square foot bag. For immediate sale, $375.00. Address H. Cain, Rossville, Illinois. E-545

Wanted—At once. An eight foot Chicago brake. Must be cheap. Address Wm. Mooring, Sheldon, Iowa. J-545

SHEET METAL MACHINERY

Complete Stocks—New and Used
Rolls—Shears—Brakes—Presses
Folders—Stakes—Drills—Etc.

— Rebuilt Bargains —

30" Square Shear with gauges	$35.00
30"x2" Plain Roll	12.50
Niagara Burring Machine	7.50

WRITE FOR SPECIAL BULLETIN "C"

WE BUY, SELL AND EXCHANGE

INTERSTATE MACHINERY CO. 130 S. Clinton Street Chicago, Illinois

OVERNIGHT

DELIVERY...

All modes of transportation are used to guarantee

"OVERNIGHT DELIVERY"

In addition to the well assorted Barnes Stock which your Jobber maintains for you, the centrally located, automatically equipped Barnes Plant further assures "SAME DAY SHIPMENT".

Specify Barnes for Quality with Service.

THE SYMBOL

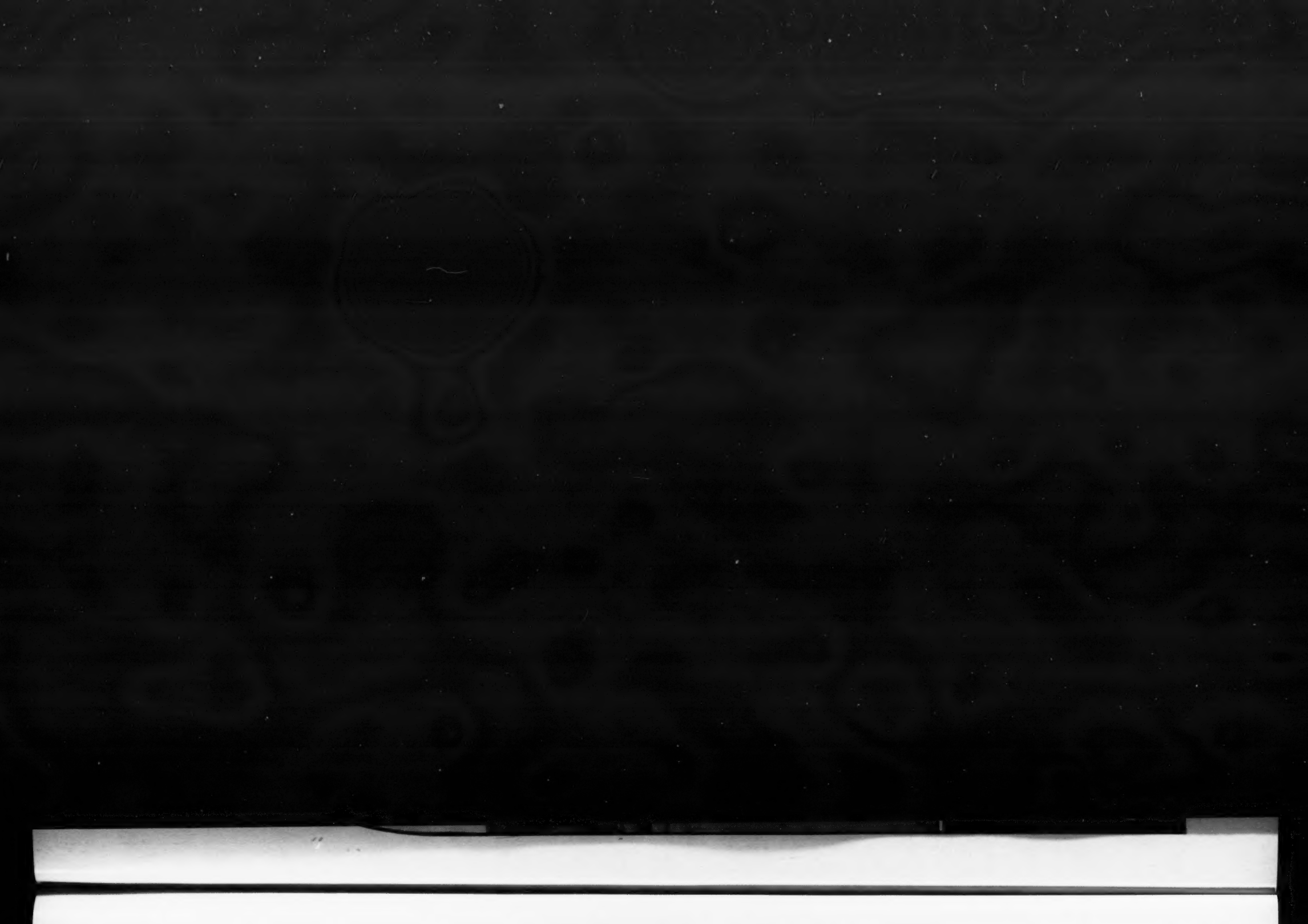
Barnes

OF SERVICE

BARNES METAL PRODUCTS COMPANY

4425 W. 16th Street — MANUFACTURERS OF CONDUCTOR PIPE, ELBOWS, EAVES TROUGH AND FITTINGS. ALL SIZES. ALL METALS — **Chicago, Illinois**

Say you saw it in AMERICAN ARTISAN—Thank you!



COURTESY, COLUMBIAN STEEL TANK CO.

If You Use Steel

WHETHER you use steel for roofing, guttering, oil tanks or railroad cars, this message may show you how to effect important savings in production cost or an improvement in the design of your product.

Here's what the Columbian Steel Tank Company of Kansas City says about the Granite City Steel used in the construction of the Semi-Trailer shown above.

"This superior steel, plus superior construction, enables us to eliminate the ordinary drop frame for supporting the tank — the rear axle and the fifth wheel being attached directly to the tank itself. This makes possible a great saving in weight and an unusually low mounting."

And Granite City Steel quality is matched by Granite City Steel service — 29 railroads and the Mississippi River assure prompt delivery to the Mississippi Valley, the West and the Southwest.

Chicago, Dallas
Kansas City
Los Angeles

SINCE
REG. U.S. PAT. OFF.
GRANITE CITY STEEL
1878

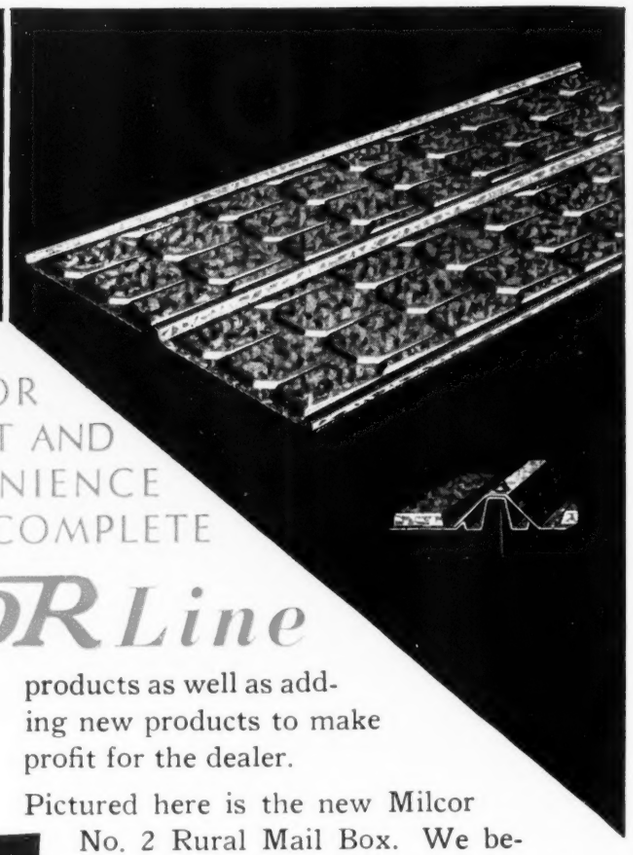
St. Louis, St. Paul
San Francisco
Salt Lake City

GALVANIZED SHEETS
STEEL SHEETS
PLATES AND
TIN PLATE

•

GRANITE CITY STEEL CO

GRANITE CITY, ILLINOIS



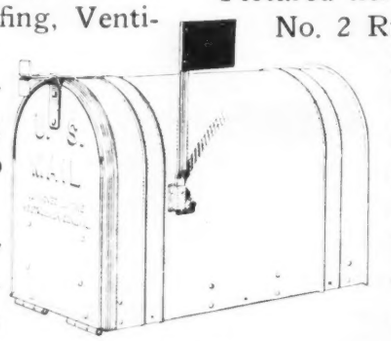
FOR
PROFIT AND
CONVENIENCE
USE THE COMPLETE

MILCOR Line

The Milcor Line of Sheet Metal Building Products meets every need. In Rain Carrying Equipment, Twodrain Channel Roofing, Ventilators, Skylights, Finials and Ridge Rolls, Milcor offers highest quality and special features found in no others.

Milcor is constantly improving and developing its products as well as adding new products to make profit for the dealer.

Pictured here is the new Milcor No. 2 Rural Mail Box. We believe it to be the finest and best built Mail Box of its kind on the market, yet it sells at an extremely low cost. Consult the Milcor Price List first. Then write to us for anything you want.



MILCOR PRODUCTS

Copper Alloy Steel

Save with Steel

MILCOR STEEL COMPANY

MILWAUKEE, WIS., 4417 W. Burnham St. CANTON, OHIO
Chicago, Ill. Kansas City, Mo. LaCrosse, Wis.

Sales Offices: New York, 418 Pershing Square Building; Boston, Mass., 726 Little Building; Atlanta, Ga., 207 Boisa Alley Building; Little Rock, Ark., 104 W. Markham Street